Frankly Speaking

Current Problems

"Traffic conditions in our business district are becoming intolerable, this congestion is driving shoppers elsewhere, the time has come for action," said the President of the Merchants' Association before a crowded Chamber of Commerce meeting. This is typical of the thinking that is going on in hundreds of cities; traffic control is now recognized as one of the important *current problems* facing our civilization.

A recent survey conducted by our Editor, in 199 cities, indicates that all of them are worried about the traffic problem and are trying to solve it. The significant part is that they are using traffic engineering techniques. The analysis shows that 36 per cent of the cities are prohibiting parking during peak hours, 42 per cent have provided one-way streets, 60 per cent prohibit turning movements and 20 per cent of the cities have established parking authorities or committees to provide and plan for off-street parking facilities.

Traffic engineers realize, however, that existing conditions, bad as they are, must be considered as only a start of what will have to be dealt with when automobile production really gets into stride. No local repair job is going to do the trick. Adequate off-street parking facilities must be provided for the storage of cars and more people must be encouraged to use buses, street cars and trackless trolleys so as to reduce the number of motor vehicles using the streets, especially in constantly congested areas.

This is a great challenge to the traffic engineering profession and they are prepared to meet and conquer it.

Robert A. Mitchell

Vice President

PARKING AND PEDESTRIANS REVEALED AS MAJOR CURRENT TRAFFIC PROBLEMS

According to a survey of traffic authorities in 135 different cities, parking and pedestrians are the two major traffic headaches, with speed control and peak hour traffic flow problems following in close order.

This information was obtained in answer to a questionnaire mailed out by the Traffic Engineering Division, National Conservation Bureau. A break-down of the interest shown by different groups in various traffic problems follows. The subjects are listed in order of importance, as indicated by the questionnaire totals:

City Engineers:
1. Parking
2. Pedestrians
3. Commercial Vehicle Loading

Police:
1. Parking
2. Pedestrians
3. Peak Traffic Flow

State Highway Engineers:
1. Parking
2. Speed
3. Left-Turn Problems

Safety Councils:
1. Pedestrians
2. Speed
3. Parking

Transit Companies:
1. Public Transit
2. Peak Traffic Flow
3. Parking

All Groups Combined, incl. unclassified:
1. Parking
2. Pedestrians
3. Speed
4. Peak Traffic Flow
5. Left-Turn Problems
6. Public Transit
7. Commercial Vehicle Loading
8. Night Accidents

With practically every U. S. community from 1,000 to 10,000,000 population plagued with lack of convenient curb or off-street parking space during most of each business day, it was expected that parking would head the list as the No. 1 problem. Then too, since from 60% to 100% of the traffic deaths in cities are pedestrian fatalities, it is logical that problems of pedestrian control should occupy a major position of importance in this listing.

Problems of speed control occupy third place in importance according to this poll. Importance of this factor is attested to by the fact that "speed too fast for conditions" is the most frequently cited cause of traffic accidents.

Left-turning problems as well as peak hour traffic, next in order, are often tied very closely together, as one of the most popular expedients to reducing peak hour traffic delays is the prohibition of left-turns at intersections.

What Cities are Doing About it

In order to find out what various cities are doing about combating these major traffic problems, a second questionnaire was sent out by the Editor of Traffic Engineering magazine to 400 cities ranging in size up to a million population. Answers were received from 199 cities.

Under the heading of Parking, it was learned that 39 cities have established some sort of parking authority or committee to handle problems of financing and planning off-street parking facilities. Seventy-two cities replied that they prohibit parking at the curb on express streets during peak flow periods.

In connection with Pedestrian control, 96 cities' replies indicated that pe-

destrians "really are obedient to signals and regulations". Special "walk" lights are in use in 59 cities it was learned.

Methods of handling turning problems and peak hour traffic snarls are indicated as follows: In 114 cities, turns are prohibited at main intersections in peak hours. Eighty-four cities have created one-way streets recently to expedite traffic movement, and 52 cities prohibit commercial truck loading and unloading in rush hours.

The most popular expedient appears to be prohibiting left-turns, as 60% of the cities replying stated they were doing this.

Proof of the widespread effect of traffic congestion on small communities as well as large cities is given by the fact that the percentage of places under 50,000 adopting these expedients did not differ greatly from the percentages in the larger communities.

Administration of Parking Program

According to a questionnaire sent to forty cities professing to have a special administrative unit setup to handle the parking program the most popular type of unit consists of certain members of the city council. Of about equal popularity is a committee composed of: (1) mayor or other council representative, (2) city engineer or equivalent, (3) chief of police, traffic captain or traffic engineer. A number of cities have turned over the parking program to the City Planning Board.

If a City Parking Authority is defined as a special body set up with power to condemn, construct and provide facilities, and to raise funds under its own authority by the issuance of bonds or otherwise, then very few cities have Parking Authorities.

Madison, Wisc., has such an authority and it was just recently appointed. It is in the process of purchasing additional parking lots now. The Authority is composed of the Mayor, City Engineer and the Captain of Traffic.

Wheeling, W. Va., has a Wharf Parking Authority, appointed by the Mayor in 1944, consisting of three citizens, that has developed a 3-story concrete storage plaza.

Most other cities have powers to condemn land, set up parking facilities, and finance through bond issues or budget appropriations, but have not delegated these powers to separate bodies.

This Issue Dedicated to Current Problems

In view of the unprecedented interest in current traffic problems that has been developed by the entire nation, it was decided to focus this issue on and entitle it CURRENT PROBLEMS. The questionnaire poll revealed the principal problems, as outlined in the preceding report, therefore outstanding traffic authorities were requested to prepare the following articles on these current problems especially for this special edition of TRAFFIC ENGINEERING magazine.

ABOUT MONEY AND PARKING

Highland Park, Michigan, voters have approved a proposal for a city-owned and operated parking lot financed by special assessments, and in Monroe, Michigan, local merchants raising $40,000 out of an $80,000 estimated cost for a 600-car parking lot. The city will furnish the site and remaining funds. . . . . Los Angeles recently increased its parking fine from $2 to $10 and noted an almost immediate reduction in number of parking violations. . . . . In Cleveland a sharp decline in number of persons parking cars in bus stop zones followed imposition of a $5 fine for that offense. . . . . New York city fines drivers $15 for parking in restricted Manhattan area. . . . . Two-time offenders pay $25, and the fine is obosted to $40 for the third offense. From *Public Management*, Jan. 1947.

The Effect of Curb Parking on Street Capacity

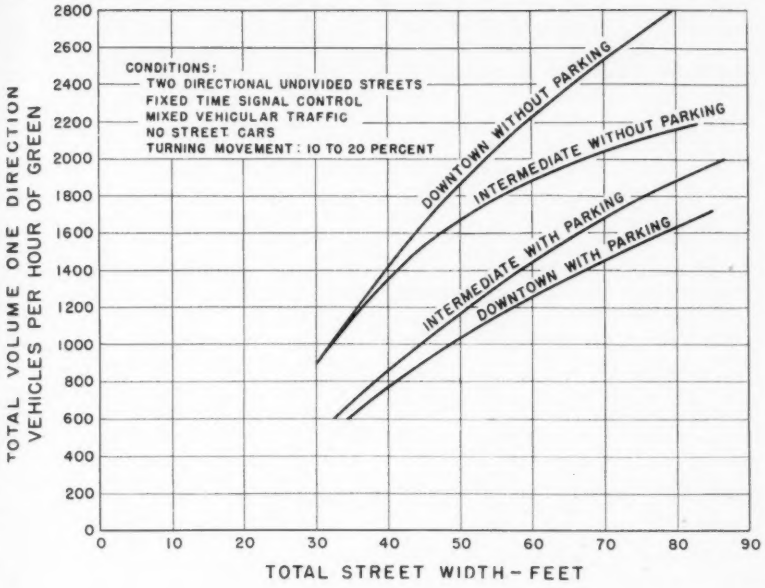
by W. P. WALKER AND O. K. NORMANN, *Member, I.T.E.*

The capacity of a city street in terms of vehicles per hour is generally governed by the capacity of its intersections. A street may be said to have reached its maximum practical capacity in the one direction under the prevailing conditions when there is a backlog of vehicles on the approach to a signalized intersection throughout most of the peak hour. Based on this hypothesis, data for about 300 intersections in cities of all sizes and in most States have been collected and analyzed. (The questionnaire form used in the survey, accompanied by a brief description, is illustrated in the June, 1946 issue of TRAFFIC ENGINEERING.)

The reduction in capacity caused by curb parking is the difference between the capacity of streets with parking and similar streets without parking. The chart on the opposite page shows that in downtown areas a 40-foot street on which parking is permitted has about 55 per cent of the capacity of the same width street on which parking is banned. The reduction of 45 per cent in street capacity is somewhat greater than the portion of the total street width actually occupied by the parked vehicles, which would be 35 per cent assuming the parked vehicles to be within 7 feet of the curbs. On the wider streets in the downtown areas, however, the difference between the reduction in capacity due to the parked vehicles and the actual space they occupy in the street is much greater. Seventy-foot streets, for example, are deprived of 43 per cent of their capacity by parked vehicles that occupy only 20 per cent of the street width. In other words, although the average parked vehicle is only slightly more than 6 feet wide, each line of parked vehicles together with the interference to moving traffic caused by vehicles entering and leaving the parking spaces reduces the effective width of a 70-foot street approximately 14 feet.

It is significant that whatever the width of a downtown street, curb parking reduces its capacity by an amount varying from 43 per cent for the wider streets to 47 per cent for the narrower streets. A 40-foot street with no parking at the curb has the same capacity as a 68-foot street on which parking is permitted. Two 40-foot streets with parking are necessary to accommodate the volume of traffic that can be moved over a single 42-foot street on which parking is prohibited. These are sobering facts and if the inquisitive economist is so inclined, he can show that the taxpayer is contributing a sizable donation for the privilege these motorists are enjoying. The cost will certainly reach a figure exceeding the small fee deposited in a parking meter.

W. P. Walker is employed as a Highway Engineer, Division of Highway Transport Research, U. S. Public Roads Administration, Washington, D. C. O. K. Normann is chief, Section of Traffic Operations, Division of Highway Transportation, Public Roads Administration.



However the story is not yet complete. A considerable portion of the traffic using many streets is there because the drivers are trying to find vacant parking spaces. Just how much of the traffic on a street is so induced depends upon a large number of variables. As an illustration of its magnitude, however, a survey in Chicago showed 7 per cent of the cars on a particular street to be cruising. One driver circled a block eleven times, crossing 8 pedestrian crosswalks each time around. Another drove 5.8 miles to enter the busiest intersection eleven times. During the entire period of the survey, parking space was available in a free parking area less than 600 feet away. (See "Local Planning Administration" by Ladislas Segoe, published by the Institute for Training in Municipal Administration, Chicago, Illinois, June 1941.) These curb parkers not only divest the street of a 45 per cent equivalent of its usable width, when parked, but also add appreciably to the volume of traffic that congests the remaining portion. The results of the survey mentioned above illustrate the futility of trying to entice curb parkers away from that destination by offering them free off-street facilities a mere block away. The only apparent means of removing curb parking from the street is by an enforced parking ban.

There are exceptions, of course, to all rules, and there are conditions under which parked vehicles will reduce the street capacity to a much lesser extent than the figures expressed above would indicate. One such condition, as an example, might be the presence of an exit from a parking garage in a particular block which would discourage the use of the curb lane even though

no cars were parked there. Under just such a condition in Pittsburgh it was observed that only 7.7 per cent of the traffic was in the curb lane as compared to 49.9 per cent observed in that lane in the next block. (See "Causes of Failure in Handling Traffic" by Lewis W. McIntyre. Proc. ASCE, November 1937.) In this particular instance the presence of parked vehicles at the curb would have reduced the street capacity by an amount considerably less than 45 per cent, although it would have been more than 7.7 per cent.

Another illustration is that of a street intersection with a moderately heavy right-turn movement and where parking is permitted to within a few car lengths of the intersection. With a short signal cycle the capacity of the curb lane may approach that of a through lane, but it will rarely exceed to an appreciable extent the number of cars turning right. Through traffic definitely avoids using a curb lane under these conditions.

The two curves on the chart identified as "Intermediate without parking" and "Intermediate with parking" represent the results obtained by the capacity analysis of congested intersections in residential districts located within areas that are approximately midway between the city limits and the central business districts. Both of these curves show street capacities that are higher than the capacities for downtown streets where parking is permitted and lower than the capacities on downtown streets where parking is prohibited. There are several possible reasons for the difference in capacity between the streets in the downtown areas and those in the intermediate areas. The most important reasons, however, are probably:

1. The larger number of pedestrians at the intersections in the downtown areas.

2. The greater demand for parking spaces in the downtown areas than in the intermediate areas. As a result, the curb parking spaces in the downtown areas are more nearly used to their capacity than the spaces in the intermediate areas. Also, there is more movement in and out of the parking spaces in the downtown areas.

3. Parking restrictions in the downtown areas are more rigidly enforced than parking restrictions in the intermediate areas. Other traffic controls such as the elimination of turning movements, pedestrian control, etc., which tend to increase intersection capacities are also practiced to a greater extent in the downtown areas than in the intermediate areas, especially at intersections on streets where parking is prohibited.

The first two of the above items apparently account for the greater intersection capacities on streets where parking is permitted in the intermediate areas rather than in the downtown areas. The third item probably accounts for the greater capacity in the downtown areas than in the intermediate areas for locations where curb parking is prohibited.

Permitting curb parking has less effect on street capacities in intermediate areas away from business centers than in downtown areas because fewer cars are found at the curb even though it may be perfectly legal to park. The average reduction in street capacity by permitting parking in the intermediate areas is 35 per cent compared to an overall average of 45 per cent in the downtown areas.

Curb parking is only one of the several factors that reduce the capacity of a traffic lane from a possible high of about 2,000 vehicles per hour to as little as two or three- hundred vehicles per hour, but there can be no denial that it is a very important factor.

Financing Off-Street Parking Facilities

by BURTON W. MARSH, *Member I.T.E.*
AND LEVERNE JOHNSON, *Junior Member I.T.E*

Between 1920 and 1940 we in this country spent in excess of 41 billion dollars for highways. How much has been spent for off-street parking is not known; but, whatever the amount, it is crystal clear that it hasn't met the need, for it is manifest that one of the most serious transportation problems facing the American City today is that of inadequate parking facilities.

The physical aspects of the parking structures, laying out parking areas, designing entrances, exits, and devising systems of operation—are all if not simple, at least straightforward and subject to established engineering techniques. "Give me the money," says the engineer, "and I can build anything that can be built." But right then he raises the 64-dollar question!

"Where do we get the money?" is always asked by some practical soul when discussion of the parking problem gets to the "action" stage. Even more basic, however, is "who" is finally going to pay the bill, or how will proper credit and suitable security be obtained so that funds can be raised through some established borrowing procedure. There are many who say that all costs of off-street parking should be paid by the user, irrespective of how the funds are raised originally. They are likely to give this idea as a reason why financing should be solely on a private-enterprise basis. Public financing often is frowned upon on the basis that the benefits accrue to only a limited number of persons who use the parking facilities daily. But in such thinking, public financing is often confused with public subsidy.

Users should pay for parking to the full extent of their benefits, as should other beneficiaries such as the municipality as a whole and business property owners in the area affected.

Parking facility users usually pay through parking fees. The municipality can pay its share by contributing through use of general funds to the original purchase and development cost without expectation of return from such contribution. Benefitted properties can pay their share beyond what they pay as general taxpayers by special assessment.

Public Participation in Financing Desirable

It is evident, even to the casual observer, that private capital has not produced needed parking facilities. There is considerable question of whether private capital will desire to provide the low cost parking necessary for the great bulk of potential parkers. The profit obtainable will generally not be sufficiently attractive. Hence, it is believed that public participation is necessary at least to the extent of making original factual studies, locating sites, assembling needed properties with public funds, assuring suitably low parking fees and other controls.

Among the advantages of such a plan are: (1) parking facilities are lo-

Burton Marsh is Director and LeVerne Johnson, Traffic Engineer, Traffic Engineering and Safety Department, American Automobile Association, Washington, D. C.

cated in accordance with need as determined by facts, (2) rates can be set to attract short-time or all-day parkers who should use a facility according to its location, (3) parking facilities are permanent and not subject to abandonment to some other use with a better earning power, (4) the property can pay reduced taxes or be tax free as an added contribution by the City and hence, parking rates could be lower, (5) the whole parking program can be coordinated with centralized authority or control.

The described public participation would permit either municipal operation or sale or lease of parking facilities to private operators subject to controls set forth in the contract. With public ownership and private operation, the opposition by persons who contend that municipal operation is inefficient and expensive, is overcome or reduced. Thus, there would be few additional public employees, yet the necessary municipal controls would still be maintained.

Enabling Legislation Necessary

It is necessary to have or to obtain legislation approval through a State enabling Act for a municipality to participate financially in off-street parking projects, particularly where fees are to be charged. According to a study by David R. Levin of the U. S. Public Roads Administration, published in March of this year, there are "laws in 10 States and the District of Columbia applicable to parking facilities in 13 different cities (which) permit the recoupment, in whole or in part, of the costs of establishing and maintaining parking facilities through fees or special charges levied against the user or beneficiary of special privileges."

The general concept of state enabling legislation which permits the creation of a special municipal parking authority or agency encompasses the assembly and acquisition of property for parking purposes with public funds, permits leasing for private operation, and recoupment through fees from users and benefit assessment or general taxation. These ideas are included in a Model State Enabling Staute published by the Highway Research Board which provides for the financing of parking facilities "by any one or any combination of the following methods: (a) general obligation bonds . . . . or revenue bonds payable solely out of revenue from parking facilities; (b) special or benefit assessments . . . . to be assessed . . . . in proportion to benefit derived; (c) parking fees and special charges . . . . derived from the use of off-street parking facilities by motorists, lessees, concessionaries, or others; (d) general fund appropriations to the extent deemed necessary or desirable; (e) State and Federal grants and local aids; (f) parking meter revenues; (g) general property taxes; (h) gift, bequest, devise, grant, or otherwise."

Actions permitted under such legislation are—as is entirely proper—subject to specific authorization and approval of the legislative body of the municipality. The failure to provide by law for such responsibility to elected representatives of the people has been one major objection to the creation of municipal parking authorities or agencies.

With regard to the lease of facilities to private operators, the abovenamed model statute states: "Each automobile parking agency is hereby authorized to maintain and operate public off-street automobile parking facilities or to contract therefor; or lease the same to competitive bidding, to any firm, or corporation, upon such terms and conditions as the public interest may warrant."

A review of most present enabling

The Ballinger Company, Philadelphia

An architect's sketch of the Stephen Girard Building in Philadelphia, in which commercially valuable lower floors are used for retail stores and upper stories devoted to parking.

statutes in this field indicates that there is legal precedent and sanction for carrying out substantially all of the actions proposed above. For example, in five states—California, Indiana, Kansas, Minnesota and New Jersey—general obligation bonds are permitted. Revenue bonds are authorized in six states—Illinois, Indiana, Kentucky, Michigan, West Virginia and Wisconsin. Benefit assessments may be used in California, Kansas, Minnesota and West Virginia. In California, Indiana, Iowa and Kansas appropriations from general funds are permitted. These data are from an "Analysis of General State Enabling Legislation Dealing with Automobile Parking Facilities," Highway Research Board, Bulletin No. 2, Revised, January, 1947.

The question of the lease of lands or properties acquired with public funds to private operators is not specifically mentioned in a number of existing statutes, but such action is either specifically or by implication authorized in California, District of Columbia, Illinois, Kentucky, Minnesota, New York and West Virginia. It is probable that lease to private operators is permitted in a number of other states having similar legislation but without specific provision for such leases.

Examples of Financing Plans

Pittsburgh's new downtown parking plan involves the creation of a special authority or commission and the ultimate construction of some 20 new parking garages. It provides for financing by 30-year revenue bonds to be issued by the authority, and for rev-

enues to come from users of the facilities.

Kansas City, Kansas' six new free parking lots, which cost approximately $285,000, were financed by assessing 80 per cent of the cost against benefitted properties. Assessments were apportioned by court-appointed appraisers, and are payable over a 10-year period. The remaining 20 per cent was provided from general municipal funds. Parking is limited by ordinance to three hours for which no fee is collected. Those who violate the ordinance pay a fine on a sliding scale.

Municipal parking facilities in Miami Beach, Florida, are being financed by an original $50,000 appropriation by the City plus a later $300,000 revenue bond issue. Retirement of the indebtedness will be accomplished mainly by fees from users collected by means of parking meters installed on the lots.

A $60,000 Shoppers' Parking Lot in Kalamazoo, Michigan, was financed through benefit assessment based on distance of the property from the lot, tax value and size of the property. Payment of assessments is over a 10-year period. Users pay for parking only after the expiration of a two-hour free period.

A 1946 enabling act permits the City of Boston to borrow up to $5,000,000 to provide off-street parking facilities, and for the lease of properties to private operators under certain controlled conditions. Parking fees will be set up by the agency of the city designated to administer the provision of the act.

Bluefield, West Virginia, a city of 25,000 population, is erecting an 800-car-capacity deck-type garage at a cost for land and construction of over half a million dollars. It is being financed entirely through the issuance of revenue bonds to be amortized over a 20-year period through parking fees and the contemplated lease of the first floor to a private service station operator.

Summary

From the principles set forth and the examples of present and proposed financing plans, it is evident that there is precedent for and a trend toward public participation in parking finance, and that ways are being sought to allocate costs in an equitable manner to all beneficiaries, as follows:

(1) The user who should participate through the payment of parking fees.

(2) The benefitted properties which should participate through equitable special assessments.

(3) The municipality which should participate through general tax funds, or through tax abatement, or both.

It is obvious that the proper shares of cost for the three groups will vary according to conditions. For example, the major cost of parking facilities in a fringe lot near the business district primarily for all-day parkers, should be borne by users or by a specific enterprise providing parking for its employees. On the other hand, for facilities within the "core" of the business district, primarily for short-time parkers, a larger share should be borne by owners of benefited properties. Financial participation by the municipality should be smaller in most cases than for either of the other benefitted groups (note the 20 per cent appropriation from general funds mentioned in Kansas City.)

DEATHLESS CITIES

Thirty-five cities of 10,000 population or more completed 1946 without a traffic death. New Britain, Conn., with a population of 68,700 was the largest city to achieve this record. Hamtramck, Mich., was second and Watertown, N. Y., was third, according to the National Safety Council.

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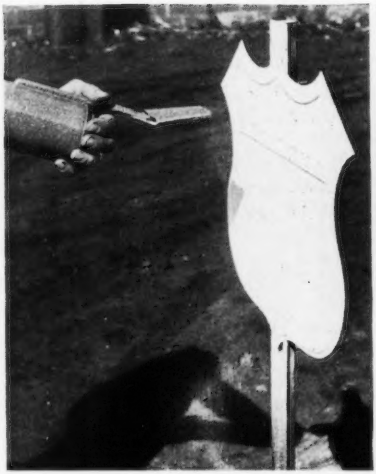

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HUNTINGDON . . . . . PENNSYLVANIA

Thank You - Mr. Engineer

by B. R. CALDWELL, *Deputy Chief*
Director, Traffic Bureau
Los Angeles Police Department

Sometimes it is a minor improvement such as painting a limit line on the street or painting a signal standard a color which will contrast with its background; at other times, it involves more extensive improvements such as realigning roadways, channelization and grade separations, but everything a traffic engineer does has an effect, either favorable or adverse, on the job of the traffic law enforcement officer.

We are often prone to forget that the citizen is not a machine but a human being, subject to human foibles and frustrations. Recognizing him as such, we must not only provide him with every opportunity for safe and proper driving, we must also make our regulations and requirements perfectly clear to him at all times. This means that our control measures must be obvious not only to the alert driver but also to the confused driver, the sleepy driver, and to the driver whose attention is momentarily diverted by his radio or cigarette lighter or his passengers. They must be obvious to the driver whose mind is on his business, domestic or financial problems. In short, traffic regulations must be so obvious that they are recognized by the motorist who is devoting only half his attention to his driving.

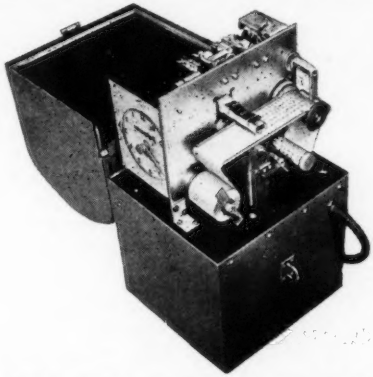
The average citizen is a reasonable individual who will conform to whatever regulations are established whenever such regulations are readily apparent to him. It is the job of the Traffic Engineer to make the requirements perfectly apparent to every driver.

Simple Engineering Change Aided Enforcement

A number of individuals, who were cited for going through the red light at a certain intersection in the City of Los Angeles, complained to the citing officers that they could not see the signal. The alert motorcycle officers made several approaches to the signal and found that the complainants were well justified; in approaching in one particular lane, the signal blended so completely with the background that it could hardly be seen. A report was made to the Traffic Engineer as a result of which a lemon yellow plate was fixed around the signal head. Signal observance improved appreciably and permitted the officers' attention to be directed to other more hazardous locations.

Many bad accident locations can be, of course, improved by engineering adjustments thus allowing officers to be assigned to other beats. In the City of Los Angeles, where the traffic enforcement strength of the Department is so limited, motorcycle officers must necessarily be carefully deployed. Although the principles of selective enforcement are fully utilized, the alleviation or elimination of hazardous locations by engineering adjustments allows the traffic enforcement personnel to be assigned to those high accident locations not subject to engineering improvement.

There are many ways in which good traffic engineering can assist the enforcement officer. Among them:



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STREETER-AMET

Pedestrian Protection and Control

by GEORGE E. KENEIPP,
Director of Vehicles and Traffic
Washington, D. C.

In the Spring of 1946, the District of Columbia Highway Planning Survey made a cordon count of the retail district which comprises an area of approximately one-fourth square mile. During a period of 17 hours, 754,444 persons entered that area and of these, 143,949 were pedestrians at the time of crossing the cordon. How many others joined their ranks within the cordon is unknown but it is certain that it was a sizable number. This illustration gives some idea of the number of people concentrated in and circulating about a relatively small area.

The results of a pedestrian volume count at a location bordering the retail area—12th St. and Pennsylvania Avenue, N.W.—supply an interesting example. Between the hours of 5 and 6 P.M., 12,405 pedestrians crossed the street in competition with 3,885 free-wheeled vehicles and 136 street cars. This intersection, incidentally, is controlled by traffic signals and supplemented by a police officer.

Problem is Complex

Despite the fact that Washington's pedestrian problem is complex, many remedial measures have been applied and others are in the blue-print stage. In 1939, for example, a regulation was adopted which specified substantially that "no pedestrian, equestrian or driver of any vehicle shall disobey the instructions of any applicable traffic sign or signal unless directed to do so by a police officer." At the same time, the pedestrians' right of way between intersections was clarified by the statement that "no pedestrian should use any roadway between intersections when a vehicle is approaching from

(Continued from Previous Page)

1. It allows the Enforcement Officer to be assigned to other high accident locations not subject to engineering adjustment.
2. It makes for public acceptance of regulatory devices and measures.
3. It encourages general public compliance with regulations and thus decreases the need for enforcement.
4. It assists in public understanding and support for the entire traffic program.

It has been our experience that the people of a community are reasonable and will accept any recommendation or regulation for their own good so long as the needs are intelligently presented by public servants who have previously demonstrated their integrity.

The best means of demonstrating this integrity in the field of traffic control is by a sound program of selectively applied traffic law enforcement and by strict adherence to recognized standards and warrants in the installation of traffic engineering control. An intelligent job in either field makes the job of those in the other field much easier.

either direction so as to constitute a hazard for his own safety or use such roadway at any time in a negligent or reckless manner." After a reasonable period during which a vigorous educational program was conducted, the enforcement of these regulations began. The first person arrested for violation of the former regulation appealed his conviction and it was agreed that this should become a test case. The courts upheld the pedestrian control regulation.

Prior to adoption of the regulation, sample studies were made and were repeated four months after their adoption. The results of these studies disclosed a marked improvement in the observance of regulatory devices. Before the regulations were in force 61 per cent of the pedestrians observed started on the green light. After their adoption compliance increased to 85 per cent. Both of these observations were made without a police officer present. At sample intersections, however, with a police officer on duty, the percentage of pedestrians starting on the green light rose to 93 per cent. These observations covered the actions of approximately 62,000 pedestrians.

Pedestrians Respect Law

Control methods may be divided into two classes, passive and active, of which each are probably of equal importance. Among the active controls, we would place police "presence" and police enforcement. As an example of police "presence", there was the eight per cent increase in the observance of traffic signals. An efficient police officer supplementing a good traffic control system seems to represent one of the best methods of handling large concentrations of pedestrians at street grade.

There appears to be a decided resistance among the public to the use of pedestrian subways for crossing streets. Some years ago, the District constructed a subway beneath a busy arterial highway, connecting a large school with a heavily populated residential area. It was used so rarely and its abuse was so marked that it has since been closed. On the other hand, we have found that the majority of the people will use such devices when they lead to a public utility conveyance. By the use of such a structure we have eliminated an extremely hazardous situation near the Department of Agriculture. During the evening rush period, there were previously some 6,000 persons flooding over the streets in a scramble for transportation. With the completion of a terminal underground, with direct access to it from most of the adjacent buildings, few pedestrians now use the surface route. As a result, accidents involving pedestrians are negligible in this area. Two projects similar in nature are scheduled in the near future.

Another active control measure in the planning stage calls for construction of pedestrian barricades at a great many offset intersections. Around the periphery of our "Old City" in days gone by, private real estate operators developed large tracts of land without regard to any logical plan. Today we must pay the price in streets of narrow width, crooked alignment, and numerous offsets. At a great many of these streets for instance, you leave the southwest corner and walk directly across to the northeast corner. In the meantime you have traversed not only the two streams of traffic on the street you were crossing but the two streams on the street you were "paralleling." By installation of barricades in conjunction with high-type crosswalk markers we hope to eliminate many accident-prone locations.

"Don't Walk" Signals

It has been a matter of policy for some years past to construct pedestrian islands on all streets sixty feet

or wider in this city. The minimum width of these islands is four feet and we have found them very satisfactory. They serve as excellent havens of refuge for pedestrians caught in mid-street by a change of lights. These islands, combined with pedestrian walk signals which have a separate interval of the cycle devoted to pedestrian movement, have proved invaluable. This is especially true at intersections with complex turning movements and at traffic circles. We have adopted as our standard for walk signals, neon gas tubing forming the words "Don't Walk". The word "Don't" is darkened during the walk period.

Special precautions have been taken so that false indications of walk cannot be given.

Education Needed

One of the most potent passive controls, we believe, is education. This is an important item in any phase of traffic accident prevention. In Washington, we are deeply indebted to safety-conscious newspapers, radio stations, motion pictures and others who carry our messages to thousands of people we could not otherwise hope to reach. As examples, we can point to the almost 25,000 lines of traffic news in local newspapers; and in addition to a special radio series carried throughout the year, to the 102 hours of broadcast time together with the constant use of spot announcements. One radio station for example, contributes a spot announcement three times daily just prior to the opening and closing hours of schools, cautioning motorists to be alert for children. Almost 800 showings of three nationally distributed safety films were given in sixty theatres before an audience of more than 1,500,000 people. A safety slogan contest sponsored by the Traffic Advisory Board resulted in the submission of some 22,000 slogans. Cash awards were made to six winners. Two hundred thousand safety slogan cards were distributed with electric bills, and another 150,000 through the schools of the District. Ten thousand safety slogan bumper streamers were displayed on taxis, government and private fleet operators' vehicles. Material was supplied to 442 churches for use in their programs which devoted a portion of one Sunday service to safety. Plans are now in progress for additional safety educational measures.

More than 12,000 pedestrians walk to their deaths each year. Certainly this fact calls for more than lip-service to the cause of pedestrian protection and control. What is needed quite obviously is sound, flexible planning coupled with positive and direct action.

PEDESTRIAN ACCIDENTS AVERTED

Rochester's (New York) 51,000 school children crossed 1,500 street intersections four times daily during the year 1946 without a single accident.

Credit for keeping Rochester pupils from traffic injury was given to the public and parochial school traffic monitors who guard the crossings daily throughout the school year. These safety patrols last year contributed more than half a million "man" hours to crossing duty.

Calling the achievement a national record, President Roy A. Duffus of the Rochester Safety Council lauded the monitors who were hailed at a rally and film show.

Only two children have suffered serious injury at guarded school crossings in Rochester in the last twenty-five years, safety officials say.

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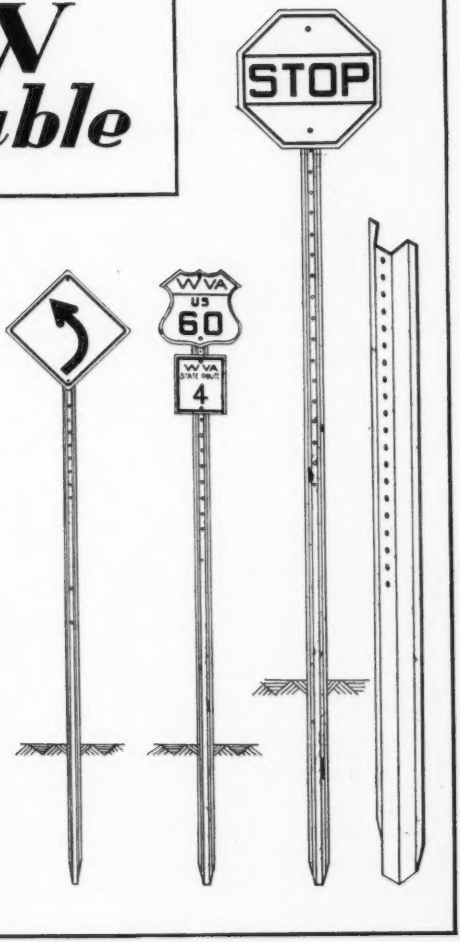

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Protecting Pedestrians at Street Intersections

by ERNEST H. MILLER, *City Traffic Engineer, South Bend, Indiana*

A comprehensive pedestrian program was started in South Bend in August 1940, after a detailed survey of pedestrian problems and analysis of pedestrian accidents were presented to the city traffic commission in the form of a report by the city traffic engineer. This report was titled "The Pedestrian — South Bend's Number One Problem in Traffic Safety."

The report revealed that the pedestrian was the most frequent victim of motor vehicle accidents in South Bend. During the period 1934 to 1939, 53 per cent of all persons killed and 48 per cent of all persons injured in traffic accidents were pedestrians.

The traffic commission took immediate action and appointed various committees within the commission to cope with the problem. Engineering, Education and Enforcement programs were organized.

South Bend did not do anything out of the ordinary in the way of pedestrian safety activity. However, the pedestrian safety program was based on facts. That our pedestrian program is not spasmodic is believed to be the main reason for its success.

It is probable that no other newspaper in the country has devoted so much space to traffic safety as the South Bend Tribune, and few other newspapers feature safety on the front page so consistently. In the 12 months following the inauguration of our pedestrian program the Tribune devoted 37 full pages to traffic safety. Most of these were about the pedestrian. The Tribune broadcasting station produced 28 hours of safety programs, and broadcast 1,250 spot announcements on safety during this same 12-month period. Other activity such as boy scouts in the central business area with posters informing motorists and pedestrians of each others rights; sidewalk messages; concentration of police officers in the area to warn motorists and pedestrians of unsafe practices and issuing of warning tickets; aided the program.

Obedience Increased

Results of continued pedestrian safety activity in South Bend are reflected in the obedience to signal indications in the central business section. In 1940 just prior to the launching of our pedestrian program, 58.3 per cent of all pedestrians observed, crossed with the green light. In 1941 eight months after the pedestrian program was in operation, 79.2 per cent walked with the green. In 1945, 94.8 per cent, and in 1946 just prior to the installation of our pedestrian walk-wait signals 98.5 per cent crossed with the green light.

The increase in pedestrian obedience to signals in 1941 over 1940 was brought about mainly through eight months of concentrated educational activity aimed particularly at the motorist. This included the stationing of police officers at the main intersections in the downtown district to insist that motorists turning right and left yield to pedestrians walking with the green light. This was done because analysis of our pedestrian accidents showed that more pedestrians were struck walking with the green light than against the red light, and that most

pedestrians were struck by turning vehicles.

Prior to 1940, motorists making turns did not yield to pedestrians. That obviously discouraged pedestrians from walking with the green light because they were usually blocked by turning vehicles. By 1941, the majority of motorists were yielding to pedestrians and a substantial increase in pedestrian obedience (from 58.3 to 79.2 per cent) was recorded. Today motorists yield nearly 100 per cent.

In August 1942, after 24 months of educational activity, the first pedestrian arrest was made for walking against a red light. This was a test case. This was the only pedestrian arrest made in 1942 for crossing against a red light. In 1943, 198 pedestrian arrests were made for crossing against a red light. In 1944, 169 arrests were made and in 1945 the number was 27.

Jaywalking Reduced

Elimination of jaywalking (crossing between street intersections) was also included in our pedestrian program and has shown similar results. For example: The worst mid-block crossing in the central area in 1940 showed 725 pedestrians per hour crossing mid-block across Michigan Street (U. S. 31) between Jefferson Boulevard and Wayne Street. Today the number is 13 per hour.

We now have pedestrian walk-wait signals at 17 intersections in the central business area. One month after the installation of the signals and before any arrests were made, voluntary obedience to the signal indications was 93.4 per cent. The enforcement program was started on the fifth week after installation of the pedestrian

General view showing new signals, waste container poster, sidewalk messages and sign below signals informing pedestrians of proper procedure.

Effect of Traffic Congestion on Cost of Distribution

by F. H. FLOYD, *Executive Secretary*
Local Cartage National Conference, Washington, D. C.

Among the greatest problems of local cartage operators (sometimes referred to as city trucking, transfer, or city delivery service) is the delay occasioned in transporting goods through our crowded metropolitan areas. Without this free flow of commerce to and from stores, factories, warehouses and freight depots, a city may easily fall from a progressive growing community to one losing its people, factories and stores to outlying communities where such transportation costs are lower and loading and unloading facilities are available.

Cost of distribution is largely one of labor—for example: A comparatively few years ago truck drivers' wages were very low, with no overtime—now the same wages generally are tripled when we consider overtime, vacations, sick leave, paid holidays, and such. Consequently, the cost of operating a truck today ranges from 5c to 20c per minute. Assuming that a merchant has ordered a toaster for Mrs. Smith, and the truck driver is delayed just 10 minutes in making such a delivery, it is immediately apparent that something from 50c to $2.00 more must be added to the price of that commodity.

What has generally been done about it? It would seem that while many urban communities have expended great sums of money in planning through-ways, all too often their planners were people who still looked upon trucks as nuisances, hence to be relegated to side streets with worn out pavements unfit for motor car travel, or something to be prohibited from places where motor cars might want to park while their owners paid a social call or went to shop or work. Little have they realized that motor trucks carry everything that makes possible their very existence in such a community and make possible a good progressive community in which to live and do business.

Taxpayer's Terminals

In an item appearing in the October issue of Fortune Magazine we find the following: "The streets and sidewalks belong to the public, but they are continually borrowed by New York City's tradesmen. Every working day thou-

(Continued from Previous Page)

walk-wait signals. It is hoped that nearly 100 per cent obedience will be obtained.

Not only has pedestrian obedience to signals greatly improved and jaywalking decreased, but the pedestrian accident experience over this same period of continuous pedestrian safety activity has also shown a decided improvement. Pedestrian fatalities in South Bend from 1934 to 1939 inclusive numbered 61 out of a total of 114 traffic fatalities. This is 53 per cent. From 1940 to 1945 inclusive the number of pedestrian fatalities was 41 out of a total of 106 traffic fatalities. This is only 39 per cent. These figures, 6 years after compared to 6 years before, are encouraging. It is hoped, however, that even greater decreases can be made.

sands of Manhattan's manufacturers, wholesalers and retailers receive a myriad of items across the sidewalks of New York, which are known as 'the taxpayer's terminal'. They do so because builders have failed to install off-street loading berths that would have reduced the ground floor space where the highest rents are obtainable. Inadequate freight elevators also keep piles of goods waiting on the sidewalks . . . .".

But compare this Manhattan situation with Rockefeller Center—where trucks are quickly shuttled by ramps into the building and there discharge or load cargo without delays to other traffic!

Certainly city planning for the future must consider the importance of this annual cost to its people due to inefficiencies. In Cleveland they propose to issue no building permits for commercial establishments unless adequate off-street loading facilities are provided for, and to further require present commercial establishments to make revision for off-street loading space. In addition, parking restrictions have been imposed on private cars to clear sidewalk loading space. The Cleveland plan for public off-street parking also is worthy of study. Other cities have plans under way that consider the important subject of truck distribution and how to aid the expeditious movement of heavy vehicles into and out of crowded districts. Fortunately, city planners are awakening to the fact that distribution of commerce is a tremendously important subject that must be helped —not further restricted!

In May of 1945, the United States Chamber of Commerce published a booklet entitled "Urban Transportation" from which we quote the following recommendations which are very pertinent to this subject.

"1. Urban planning should make provision for all needed forms of passenger and freight transportation according to foreseeable demands in each community.

3. The system of arterial highways should provide for public transit as well as individual vehicles, with necessary special facilities and proper coordination to reduce to a minimum the interference of each type of transportation with the others.

5. To permit major streets and highways to function efficiently public authorities should regulate or prohibit curb parking to the degree necessary to prevent undue interference with moving passenger and freight traffic and with essential curb loading and unloading of passenger and freight vehicles.

6. Public authorities should encourage the provision of private off-street parking facilities for hire on a stable basis, without the threat of unfair competition from free or below-cost facilities provided at public expense.

7. Parking regulations should recognize that practically every building, including residences, requires frequent or occasional service by trucks, and should make such service feasible.

8. Where the volume of commercial vehicle loading and unloading justifies, off-street facilities therefore should be required for new buildings. This requirement should apply to existing commercial buildings where economically feasible; otherwise curb loading zones should be established for the exclusive use of commercial vehicles during reasonable pick-up an delivery hours."

The Local Cartage National Conference believes these recommendations furnish a sound program that will be of greatest benefit to urban communities.

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Commercial Loading at the Curb

by Ross Shoaf, *Assoc. Member I.T.E.*
Assistant Traffic Engineer, San Francisco, Calif.

Most people and especially traffic engineers recognize that to do business in cities today all materials and goods, whether for sale or for use, must be delivered by truck, large or small. Per se, these trucks must be stopped, loaded or unloaded in a position sufficiently close to the destination of their use to be practical and economical. In spite of this recognition, however, and in spite of years of experience in central business districts designed for other than truck, bus and automobile, the tendency still persists for the building owner to erect new buildings high enough to require "sky-hooks" for supports but without adequate off-street loading facilities. Only in rare instances is legislation adopted to force proper design in the future, and in rare instances is voluntary provision for adequate facilities adopted by the building owners themselves.

As a result the traffic engineer has accepted the fact that the vast majority of materials and goods in cities must be loaded and unloaded at the curb. Unlike many other problems whose approach to solution has been a measure of the element of human nature involved, the Traffic Engineer has as yet failed to develop uniform warrants and measures of demand for the problem of commercial loading at the curb.

Demand and Supply

To isolate the problem becomes the first order of business and in this case appears to be rather direct and simple. It is the determination of the relation of demand for loading and unloading facilities to the demand of both moving vehicles and of passenger car parking at the curb.

The second order of business is to measure these demands. There are well established methods of measuring the demand of moving vehicles and reasonably well established methods for measuring the demand of parking in the normal sense as related to passenger cars. In both instances physical inventories are made, analyzed statistically and finally tempered by knowledge of origins and destinations of traffic involved. These established methods of measurement are reasonably uniform but as yet no factual method for measurement of the demand for curb loading and unloading has approached uniformity. The usual attempt at measuring this demand is with a "feeling" or by experience as to what either the passenger car owner on the one hand or the trucker or merchant on the other hand will tolerate without raising the roof of the city hall. This approach, while "practical" in solving immediate sore spots has always been found in the past to be lacking in permanancy.

For example, the measurement of demand for traffic signals by "letters from the public" or at the insistance of pressure groups has often resulted in traffic signals being installed at the wrong or the less qualified intersections. However, signals installed on a sound system of warrants based upon traffic counts and accident analysis have always been installed at the most warranted intersections first. Why then have we not developed standard warrants and measures for commercial

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curb loading—an important phase of traffic? Does not commercial loading at the curb create an excessive amount of congestion and criticism if not properly *and uniformly controlled?*

"No stopping" in the peak hour, of course, solves the problem during that period but the question is still pertinent in the concentrated area during other times of the day. Also, important streets outside of the congested area perhaps would not justify "no stopping" yet loading operations may be creating congestion and of course there are those cities in which public support is not strong enough to allow the "no stopping" law to be enforced.

Loading Operations Study

Well how can we measure the demand for commercial loading operations? The information needed is: the number of trucks servicing an establishment or group of establishments, the time of day, and the duration of the actual loading or unloading operations. The best method, of course, would be for the traffic engineer to place a traffic checker at the location to obtain this information. In most instances, however, this would require more man-power than is usually available to traffic engineers. Why not place the burden, then, upon the persons most directly interested — the merchant or group of merchants applying for the zone? Prepare forms for the applicant to fill in the information listed above together with a place for the signature of the truck driver and the license number of the truck (perhaps the nature of merchandise should be included to indicate the nature of the operation). Require that these forms be mailed in daily for a period of, say one or two weeks. This would give the traffic engineer an opportunity to spot check the applicant's honesty in reporting and a chance to check on the use being put to existing loading zones, if any. During this period, no additional or unusual enforcement should be applied regarding commercial operations.

Warrants Needed

This method of collecting data should give the traffic engineer his facts. It would then become his problem to set up warrants relating the other functions of the city streets to the demand for loading operations. Just what these warrants should be will at first require much study. They would best be determined by study of those streets where experience has indicated that moving traffic in relation to commercial loading operations have had least complications and complaints. In time, the traffic engineer and others attacking this problem on the basis of fact can probably arrive on a set of warrants, publishd as is the code on Uniform Traffic Control Devices.

It must be remembered that in the curb space sacrificed by moving traffic the balance between passenger car parking and commercial loading is a delicate one. There will never be enough curb space for either demand in concentrated areas and traffic engineers cannot relax in the campaign for off-street parking facilities and off-street loading bays. Architects should be encouraged to continually advise new commercial builders and those remodeling their stores and buildings to include commercial loading facilities off-street and off-sidewalk. The traffic engineer will be required, however, to provide equitable curb facilities for some years to come before adequate off-street facilities will relieve him of this problem—if he ever will be relieved.

Zones for Truck Sizes

There are, of course, other problems which are not so much a matter of limited regulation as they are a matter

Uniform Highway Transportation Legislation

by LOUIS R. MORONY, *Director, Uniform Laws Division, and*
CARL E. FRITTS, *Highway Engineer, Automotive Safety Foundation, Washington, D. C.*

The impact of the President's Highway Safety Conference of last year has been felt across the country with 44 legislatures in regular session this year giving strong support to Conference recommendations which urge adoption by all states of the provisions of the Uniform Vehicle Code and other nationally recommended standards.

Reiterating the need for amendments to conflicting state motor vehicle laws, President Truman recently urged state legislatures to consider the Conference recommendations in their enactment of suitable uniform legislation.

"The problem of reducing the death rate on the nation's highways," he said in part, "remains one of the most serious problems in our daily lives . . . . much of our difficulty is due to lack of uniformity in traffic laws . . . . which often confuse and mislead."

The ready response to the President's appeal for the cooperation by the state legislatures in the interests of uniform traffic regulations is evidenced by the volume of legislation introduced which either falls squarely within the recommended pattern or closely approaches accepted standards of uniformity.

At this writing most of the states are still in session and much of the legislation has not seen final action. A brief resume follows of early enactments or pending legislation of major

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of rigid legislation. One of the most important of these problems is that of the size of the truck units. There is more and more tendency for very large, even truck trailer, units to encroach upon the concentrated business areas. A zone should be defined into which these excessively large units should be allowed. In fact most of the city should be "out-of-bounds" for these units and their use should be confined to those routes and areas which can accommodate them and in areas in which their use would not unduly impose hardships upon other traffic. There is a place for these vehicles but they should be controlled and the location of their future use be planned.

Another important phase of the commercial curb loading problem is the matter of end loading. This is one problem which should be faced with both feet on the ground. The traffic engineer recognizes that most trucks in use today do not provide for side loading in very large truck units. While he should make every effort to help the trucker accomplish his loading and unloading operations by providing the necessary space, he must be insistent in opposing the practice of end loading at an angle to the curb. The blocking of one or two lanes of traffic or more than half the street as is sometimes done should be absolutely outlawed and should be subject to substantial fine or punishment. We have streets over which vehicles of a certain weight may not travel. Why not prohibit bad loading practices of certain important streets?

importance in carrying out the program of the President's Conference.

Driver Licensing

Wyoming, one of two states not requiring the licensing of drivers, enacted a driver's license law and a safety responsibility act this session. Both were in substantial agreement with the Uniform Vehicle Code. South Dakota, the other state without a license law, introduced a uniform driver's license law which failed of passage.

A number of other states have proposed amendments which would provide for considerable improvement in present driver license regulations.

Adoption of the size and weight recommendations of the American Association of State Highway Officials either in whole or in part are being considered in a good number of states, with others providing for general increases in size and weight standards or making permanent emergency wartime liberalizations.

Passage of all the provisions of Act V of the Uniform Vehicle Code covering traffic regulations are contemplated in bills in Arizona and Colorado, with many other states attempting to amend present traffic laws to comply with certain provisions of this Act. The Arizona bill includes the AASHO size and weight recommendations as well as the uniform standards for school buses recommended by the National Commission on Safety Education.

A few states have introduced legislation designed to bring their laws in compliance with the recommendations set forth in the School Bus Standards manual regarding the design of such buses, the rules of stopping on approaching such vehicles, and minimum age for school bus drivers.

About 11 states have legislation pending which provides for adoption of all or some of the sections of the Safety Responsibility Act of the Uniform Vehicle Code.

Inspection Considered

Some 16 states are seeking to provide for periodic motor vehicle inspection, following for the most part, the standards recommended.

Other bills of a miscellaneous nature having an important bearing on bringing traffic laws in greater accord with uniform standards add to the huge volume of legislation now being considered in the various state legislatures.

Much of the uniform legislation introduced is based on comparative studies that have been made of state motor vehicle laws and the provision of national uniform standards for the purpose of determining what amendments would be necessary.

Such studies, called for by safety conferences held in many of the states as a follow-up of the Conference in Washington, D. C., were made in Texas, Connecticut and Rhode Island, among others. In some instances, outside assistance was sought for the preparation of such factual reports, and the Automotive Safety Foundation, to mention one organization, was requested by officials in Arizona, Indiana and Colorado to make comparative law studies. Bill introductions in the area of uniformity in these jurisdictions were based on these studies.

A good portion of so-called uniform motor vehicle legislation introduced is not in complete compliance with all the standards recommended, but interest in uniformity has been aroused on a national basis to such a degree that in this first post-Conference year it can be said that much has been accomplished. The delegates to the Action Program meetings called by President Truman for mid-June of this year in Washington, D. C., will no doubt have substantial progress to report.

Gains in Recognition

This progress cannot be measured

alone in the volume of uniform legislation introduced, since much of it probably will not reach final enactment. A greater measure of success is scored in the general recognition that has been given to the importance of uniform motor vehicle laws as a basic and complementary step in combating the highway accident problem. However the large volume of legislation in the area of uniformity makes up only a portion of the complete legislative picture.

With most of the 44 states convening for the first time in regular session since the termination of the war, legislative introductions of a definite post-war character were inevitable.

A changeover from war to peace called for a readjustment to new and more pressing issues of social and economic rehabilitation. Fiscal problems, housing and rent control, the returning veteran and labor are among the many items within the scope of legislative deliberation; and in this category of post-war legislation, as such, bill introductions relating to highway transportation in general were given considerable emphasis.

Much of this activity is being directed to gas tax increases to meet the backlog of needed highway construction and creation of interim committees to study highway needs similar to the Engineering and Tax studies completed by the Joint Fact Finding Committee of the California legislature last year.

In several states measures have been introduced to authorize the establishment of limited access highways. In a few states measures were introduced for the creation of toll road authorities. Probably these toll road plans were conceived and brought about by the recognition of the necessity for immediate rehabilitation of the main travel routes, which will require several years to build under existing financial plans.

Recognition of the essential role of highway transportation during the war years, which to a great extent operated under liberalized emergency regulations, has led to legislative consideration for the permanent elimination of interstate highway barriers relating to reciprocity and more liberal sizes and weights.

TO SPEND HALF-BILLION ON WORKS

Detroit plans to spend $500 million on municipal improvements during the next generation, with the emphasis on a new traffic network and playgrounds, according to the American Public Works Association.

The Detroit Planning Commission has devised a public works improvement schedule calling for expenditure of $15 million a year for six years starting in 1947. More than $10 million will be spent for new sewers this year.

By 1970, if present plans are carried out, Detroit will have spent $295 million for a new system of streets and expressways, $90 million for recreation centers, parks and stadiums, and $55 million for a civic center.

Most of Detroit's capital improvement during the next few years is to be accomplished on the "pay-as-you-go" plan—without public borrowing. The city has been reducing its debt since 1941 to make this possible. Since Pearl Harbor, Detroit's debt has been lowered 19 per cent—from $328,585,000 to $266,686,000.

The Left-Turn Problem

by PAUL S. ROBINETTE, *Associate I.T.E.*
Traffic Engineer, City of Toledo

I know of no precise yardstick by which any traffic situation can be measured that will produce an exact answer as to just when left turn controls are warranted. If there is such, I would appreciate gaining this information. However, when a single vehicle executes a left turn, with no traffic on either the immediate or the cross street, there is no conflict, and no regulation is needed. It is only when there is a dense movement of traffic from the opposing direction and the vehicles waiting completion of the left turn delay other vehicles that the conflict becomes most pronounced.

I have found a convenient indication as to need for left turn controls to be a situation when the maximum lane density of traffic in the opposing direction, plus the left turn to be made through that stream approximate 65 per cent of the working capacity of the opposing traffic lane. Under this formula, if the left turns in their execution must cross but one lane of an opposing movement, I give each turning vehicle a value equivalent to three straight through movements in evaluating the demand for use of the through traffic lane. If the turns must be made through two or more opposing lanes, I give each turn movement a value of five equivalent straight through vehicles. This is an emperical formula which I have found useful but have never had the opportunity to truly develop and prove. I submit it for whatever value it may have in selection of locations for left turn controls.

In connection with the above formula, I have found that, if and when under this consideration, the working demand placed upon the opposing traffic lane reaches a level of 80 per cent of its capacity for a period of at least four hours a day, then the elimination of the left turn movement should be seriously considered, provided of course, that there are alternate routes available for those dislocated turns to use in lieu of the direct turn.

In addition to the justification for left turn control because of traffic densities, such controls in our opinion, will also be justified when any location experiences five or more accidents per year involving left turn movements; provided the accidents are of a type susceptible to reduction under the control procedure selected for application.

Time Controls

At unsignalized locations left turns can be given preference over through movements, on a permanent basis, by requiring the opposing movements to execute a "safety stop" before entering the intersection. This application is most suitable to situations where left turn movements are equal or superior to opposing through movements.

Left turns at any location can be given momentary right-of-way by posting a Police Officer to supervise such turns. This method of control is effective where turns are a problem only during a limited period of time.

At signalized intersections, left turns can be given preferential right-of-way in a number of different ways.

1. By the inclusion of a "Green Arrow" phase in the traffic signal sequence for such turns. This may

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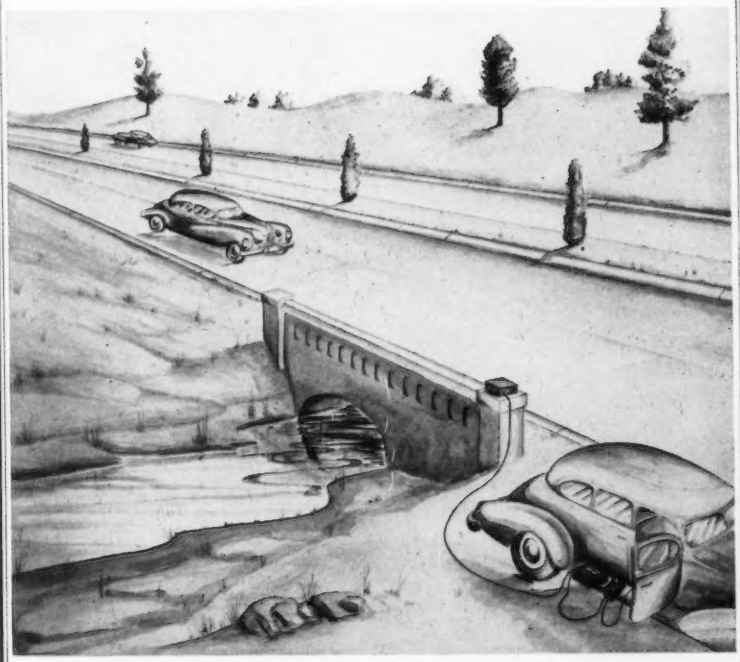

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be either an independent phase of may operate concurrently with a right turn phase for the cross-traffic movement.

2. Preference can be given left turns by splitting directional control on the street involved, permitting one direction of travel to lead the opposite by a few seconds. Then at the end of the phase, stop the first direction a similar period while the opposing direction continues to move. This gives a protected period for left turns to be made, at the beginning of the "Go" period for one direction of travel and at the end of the phase for the opposing direction.

   Under both of the above methods of signalized control, it is imperative that storage space be provided for the left turns so that the wait for the signal period does not tie up other traffic movements. This can be accomplished quite often by the elimination of parking at the right-hand curb along the length of space required for turn storages. This will permit thru movements to pass to the right of the Left Turn group, even on relatively narrow pavements.

3. Under favorable conditions particularly at "T" or "Y" type intersections, complete protection of left turns in one direction can be established by combining the "Go" phase in one direction with that of the left hand second street, and alternating the opposite direction on the other phase. This type of control imposes quite a penalty upon pedestrians crossing the major street since they are constantly exposed to vehicular traffic moving in one or the other direction; but where pedestrian interference is not serious this does provide an efficient

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method of meeting a left turn situation at those types of intersections.

4. Under certain conditions we have found it convenient and satisfactory to permit left turns to be made during the "Red Light" period of the traffic signal at locations where left turns are heavy, and a cross traffic during the "Red Light" period consists largely of right turn movements. Under this condition, the turns are authorized by installing a proper sign in connection with the traffic signal itself. This type of permissive regulation must be used with discretion and only where conditions are very favorable.

Separation as to Space

Under certain conditions, particularly where left turns become too heavy to be controlled through an allocation of time, it becomes necessary that they be separated geometrically from their conflicting movements.

This can be done in several ways:

1. By prohibiting the turn and sending the movement through the intersection to the next corner, thence on three right turns and back through the intersection as a 'straight through"—"cross-street" movement.
2. On a divided highway the potential left turns can be sent straight through the intersection to a by-pass lane beyond, where a "U" turn into the opposing lane can be made, followed by a right turn into the cross-street. Potential left turns entering from the cross-street can follow the similar course by making a right turn into the first traffic lane followed by a "U" turn through the by-pass to accomplish their left turn desire.
3. Where complex intersections require channelization, left turn movements can be segregated and sent through lanes developed for that particular purpose.

Traffic circles, highway grade separations and similar traffic interchangers meet the left turn problem in their own way, through the use of sorting and routing, without interference to other paths of travel.

4. At intersections where short left turns are the source of traffic accidents because of their conflict with right turn movements occurring concurrently, conflict can be controlled by the placement of "Teardrop" or "Lamb-chop" islands in the throat of the intersection's entries and exits. These will compel the left turns to stay in their proper place and will prevent encroachment upon the area used by the opposite turning movement.
5. Creation of one-way streets. The left turn conflict is entirely eliminated.

Elimination

Where left turns become too numerous to handle under any of the foregoing procedures, and the conflict created by such turns can not be satisfactorily insulated, then the turns should be prohibited either permanently or in many cases only during a limited period of time.

When turns are prohibited at one or more locations, they have a tendency to accumulate at the first opportunity beyond the points of prohibition. This condition should be recognized, and suitable provisions developed for the making of these turns at the locations where their accumulation can be expected.

In conclusion, from all of above it will be seen that there are many ways by which the left turn problem can be met. The success in meeting the problem will depend entirely upon the skill of the engineer in diagnosing the situation and thereafter prescribing the most effective means to reconcile the conflicts that prevail.

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(a) *The state or condition of being safe!*
(b) *Freedom from danger or risk.*

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You must concern yourself with ALL THESE SAFETY FACTORS, when buying signs to protect your motorists. PRICE alone is no factor where the lives of so many depend on your judgment for safe highway equipment.

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- ☑ **Maximum efficiency under all weather conditions!**
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- ☑ **Maximum economy, since Grote reflector buttons cost a fraction of overall reflectorization when signs require repairing.**

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ITE NEWS AND PERSONALS

MEMBERSHIP ELECTIONS

At the March 27th Board of Direction Meeting, held in New York, N. Y., the following members were elected:

New Associates:

Mr. Peter P. Hale
Yale Bureau of Highway Traffic
New Haven, Connecticut

Mr. Paul L. Brewer
Traffic Engineer
Palmer & Baker, Inc.
Consulting Engineers
Mobile, Alabama

Mr. F. Houston Wynn, Director
Hawaii Highway Planning Survey
Territorial Highway Department
Honolulu, Hawaii

New Affiliate:

Mr. Eliot V. Parker
War Dept. Safety Director
War Dept. General Staff
Washington, D. C.

Transferred from Junior to Associate:

Mr. Isaac Cabrera
International Labour Office
Geneva, Switzerland

SECTION NEWS

New York Section

Thirty-one members and guests attended the March 26 meeting of the New York Metropolitan Section, Institute of Traffic Engineers at the President Tavern, New York City.

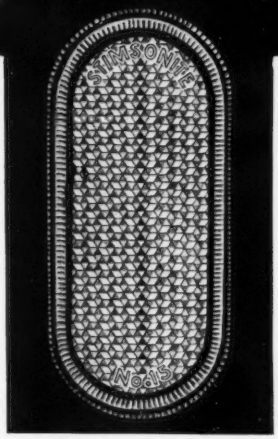
Vice President Evans opened the meeting with introduction of guests. Minutes of previous meeting were read and approved.

Mr. Evans reported on the Traffic Session of the Greater N. Y. Safety Council Annual conference, including a traffic engineering clinic on March 27 lead by Arnold Vey. The N. Y. Section co-sponsored this section at the Council Convention.

Ed Wetzel, Chairman of the Entertainment Committee, reported that an outing was scheduled for June 7—tentatively planned to be held at Les Williams' home. $2.50 per person payable in advance would be required for expenses—announcements to be sent out later. The Committee's plans were approved.

Secy. Rittgers presented the proposed Amendment to the By-Laws which had been petitioned for by 4 members and concerning which notices as required by the By-Laws had been sent out. The petition was that:

"Part 2, Article II, of the By-Laws of the Metropolitan New York Section, Institute of Traffic Engineers, be amended by deleting the words 'at least two' in the second sentence of the



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Proper marking with Stimsonite Reflector bridge and culvert markers helps prevent accidents and reduces the hazards which are costly in lives, property damage and damage to structures.

The reflector is the *new* *Stimsonite No. 15 (2½-inch yellow oval). The marker is sixteen-gauge steel, Parkerized after fabrication and finished in bright Federal yellow baked enamel.

Stocked in two standard lengths:
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**Another FIRST for Stimsonite Plastics! Now an all plastic, one-piece reflector formed by fusing a Lucite back piece with the well-known Stimsonite Reflector. Dust and moisture proof regardless of age, weather or service.*

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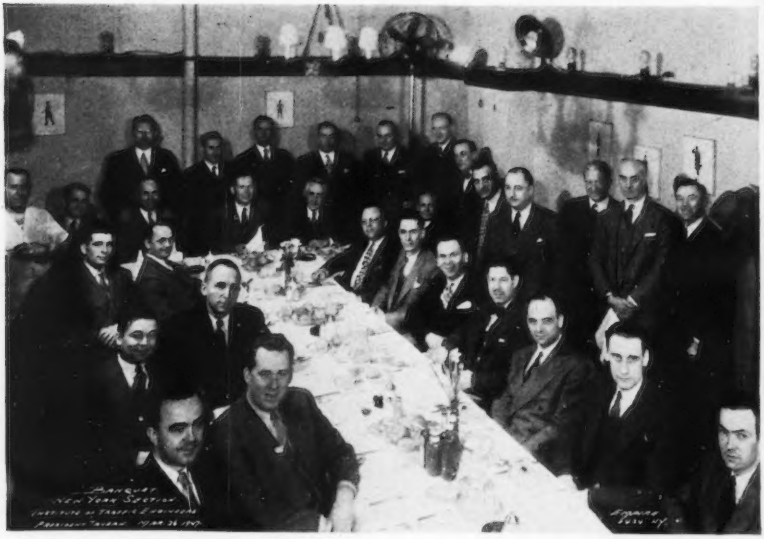

A group photograph taken at the March 26 banquet and meeting of the New York Metropolitan Section, Institute of Traffic Engineers.

paragraph and substituting therefore the words 'one or more', making this sentence read: 'The Nominating Committee shall select one or more Section Members as candidates for each office——' ".

Upon motion by Mr. Cole, duly seconded, the Amendment was voted upon and carried.

W. Earl Hall, Editor of the Mason City Globe-Gazette and chairman of the National Committee for Traffic Safety, was introduced and after leading in a group song, talked on the topic "It's Time to Quit Yawning". Informal discussion followed, stress being on stimulation of local public interest in traffic programs.

Washington, D. C. Section

Nineteen members and nine guests attended the March 26 meeting. Since Robert S. Holmes will no longer be in Washington, Mr. John Ecker was appointed Program Chairman for the remainder of the year.

After the introduction of guests, Mr. George Carroll, Special Agent of the F.B.I., explained the trip to be taken through F.B.I. Headquarters.

About 8:00 o'clock the meeting adjourned to the F.B.I. Headquarters where a two-hour tour was conducted by Foster M. Kunz and Mr. Carroll.

PERSONAL ITEMS

Harold F. Hammond, (Member ITE) Institute Member Board of Direction, has resigned as manager of the American Transit Association's Washington office and has accepted an appointment, effective April 15 as assistant manager of the transportation and communication department of the

Chamber of Commerce of the United States. He will serve under Col. Alvin B. Barber, department manager.

A past president of the Institute of Traffic Engineers, he has done private consulting work for numerous cities, Chambers of Commerce, transit companies and manufacturing firms. During the war he served as transportation consultant to the Office of Defense Transportation and to the Naval Operating Base at Norfolk, Va.

Thomas Willier, (Member I.T.E.) Traffic and Transportation Consultant, recently completed a 2-day consultation with city officials of Lancaster, Penn., advising on proper administrative and policy procedures.

I. S. Shattuck, (Member I.T.E.) Planning and Traffic Consultant in Minneapolis, is helping the City of Port Huron, Mich., develop a master plan for parking facilities.

T. T. Wiley, (Member I.T.E.) Assistant Traffic Engineer of Detroit, who has also been performing the duties of Executive Secretary of the Michigan Engineering Society and Editor of the MICHIGAN ENGINEER, has handed part of the job over to Russell Harrison, (Assoc. I.T.E.). Russ is a senior assistant traffic engineer in the Detroit Traffic Engineering Bureau and is now Associate Editor of the MICHIGAN ENGINEER.

"Teke" Wiley asked for such help because he agreed to fill in until summer as Director of Music of St. Mark's Methodist Church in Detroit, one of the large east-side churches. Teke is in charge of the choirs and the entire music program. He personally con-

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ducts the "a cappella" choir of 40 voices.

Henry Evans, (Assoc. I.T.E.) Director of the National Conservation Bureau Traffic Engineering Division, has just completed a parking survey report and recommendations for the Village of Great Neck Plaza, assisted by J. A. Carrothers, also with the Traffic Engineering Division. The report lays out a 10-year program of off-street parking.

Research Board Appoints Traffic Engineer

M. Earl Campbell, former Planning Engineer for the West Virginia State Road Commission, has been appointed Traffic Engineer for the Highway Research Board. His duties will include correlation, stimulation and guidance of practical research on traffic operation problems among states, cities and universities.

Mr. Campbell, with the Road Commission since 1936, attended the Yale Bureau of Highway Traffic in 1946 on a Foundation Fellowship.

Traffic Engineering Handbook to be Revised

According to action recently taken by the Institute Board of Direction, a joint project will be undertaken with the National Conservation Bureau, to revise and bring up-to-date the TRAFFIC ENGINEERING HANDBOOK. It is expected that the new revised publication will be ready sometime in 1948.

The decision to undertake this revision was based on the report of the Traffic Engineering Handbook Committee, headed by Graham Cole (member, ITE), Asst. Secretary, Metropolitan Life Insurance Company. This report appears in the 1945 Proceedings, Sixteenth Annual Meeting, Institute of Traffic Engineers.

The handbook revision will be under the direction of an editorial board composed of the following:

Robert A. Mitchell, Chairman
Henry K. Evans, Secretary
Donald M. McNeil
Harry Neal
Harold Hammond
Theodore M. Matson
Charles W. Prisk

SAFETY CONFERENCE FEATURES TRAFFIC ENGINEERING CLINIC

Co-sponsored by the New York Section of the Institute of Traffic Engineers, a traffic engineering clinic provided one of the high points of interest at the Greater New York Safety Conference in New York City on March 27. Attendance approximated 75 persons. The program consisted of a discussion of numerous questions by a panel of traffic authorities under the chairmanship of Arnold Vey, New Jersey State Traffic Engineer. The audience was encouraged to and did ask questions, which were supplemented by other queries posed by Chairman Vey, taken from a list of questions previously gathered through the mails by Wilbur Smith, Associate Director, Yale Bureau of Highway Traffic, who arranged the session.

The panel consisted of Merwyn Kraft, American Transit Assn.; Lou Bender, Port of New York Authority; Sidney Shapiro, Long Island Park Commission; Fred Hurd, Yale Bureau of Highway Traffic; Fred Fisch, New York State Department of Public Works, and Henry Evans, National Conservation Bureau. Among questions discussed were the following:

1. *Question*—Many plans are being developed for urban expressway systems, which when constructed are expected to provide substantial relief for

Davison Express Highway, Detroit, is lighted for full night capacity.

HOW *light* INCREASES TRAFFIC CAPACITY

The capacity of Detroit's Davison Express Highway does not shrink when the sun goes down. This is important: here, as on all traffic-relieving thoroughfares, peak loads, particularly during winter months, occur ***after dark.***

Adequately lighted at a fraction of the cost of the roadway itself, this and any traffic artery can handle just as much traffic, just as fast and just as safely, after dark as during daylight hours. If traffic slowed down, as it will on unlighted streets, capacity would be cut, congestion ensue.

More and more, traffic engineers are looking to light to help solve street and highway congestion and safety problems. General Electric lighting specialists have had broad experience in such planning — including sodium lighting of hazardous intersections and traffic routing by means of distinctive lighting. You can get in touch with these specialists through our nearest apparatus office, or by writing ***General Electric Company, Schenectady 5, N. Y.***

GENERAL ELECTRIC

452-50

municipal traffic problems. However, established street systems tributary to these new facilities will undoubtedly be required to carry increasing amounts of traffic. *What, if anything, can be undertaken to improve the efficiency of operations over such streets which cannot be widened or rebuilt?*

Fred Fisch answered this by explaining how a judicious application of engineering, enforcement and education will be needed. He mentioned particularly the advantage of staggering working hours in order to spread traffic demand over a greater period of the day, thereby lessening peak volumes. Among the palliative measures described were one-way streets, improved signal systems, prohibitions of turning movements, removal of curb parking and commercial loading operations and provision of off-street parking and loading facilities.

2. *Question—Which is more advantageous, near-side or far-side bus curb loading zones at intersections?*

Merwyn Kraft discussed the advantages and disadvantages of both and expressed the opinion that the matter often hinged on the pattern of traffic flow at the intersection, especially the amount of right-turning traffic. Kraft said that his organization, the American Transit Association, is constantly endeavoring to improve the general quality of transit vehicle operation and referred to the improvement needed in many cases in habits of transit vehicle operators at bus stops.

Kraft tended to favor near-side stops, provided no special traffic conditions prevailed, and cited these points: (a) Where bus stops at signal, then again on far side, an extra stop is thus made. Starts and stops are hard on passengers and on transit equipment too. (b) At non-signalized intersections a bus driver slows or stops before entering the intersection, for safety's sake; thus the extra wear and tear on vehicle and occupants caused by a far-side stop at any intersection. Failure to stop or slow on near side may lead to an accident. (c) A following car driver expects the bus to stop on the near side, but may not expect this stop on the exit side of the intersection. Therefore rear-end collisions may result.

He told of the experience in Salt Lake City, where near-side stops were changed over to far-side stops for a trial period, then returned to the near-side system because of the general disadvantages experienced with far-side stops.

3. *Question—What is the value of speed zoning by engineering principles?*

Mr. Hurd discussed this one, stressing the need for speed studies before zoning. He said that in his own experience with state speed zoning, that often his own ideas as to safe and proper zone speeds have been revised after a speed study had been made. Hurd reported that 38 states have authority to establish spot speed zones, and that 34 states employ spot speed studies to guide establishment of speed zones.

4. *Question—Is it important that shoulders be provided on express highways?*

Mr. Shapiro answered in the affirmative, stressing the safety factor provided by a shoulder in allowing a disabled car to be driven off the traveled portion. He said that, on freeways, the medial strip eliminates head-on collisions and pedestrian collisions are eliminated by separate walkways and limited access. Grade separations eliminate right-angle collisions. The one serious type of accident not covered then is the collision with a disabled car, and a grass shoulder, 10 feet wide, takes care of this matter. He recommended a granite block shoulder with sod on top for expressways carrying trucks and other heavy vehicles.

Simplified Curb Parking Control

by Ross C. Harger, *Assoc. Member ITE*

In a municipality of any appreciable size, parking signs comprise about 80% of the total traffic signs in use. Parking sign violations, both wilful and unintentional, are responsible for an even greater portion of the total headaches experienced by the average traffic engineer. These headaches are not severe but are a source of constant annoyance.

If you are responsible for parking control in any municipality, we would like to ask you three simple questions.

1. Have you ever had a motorist, who has received a ticket for parking between two signs which read "No Parking Between Signs", say to you, "There were six signs in the block. How was I to know between which signs I could not park"?

2. Have you ever had a driver ask you to cancel a ticket he received for parking in a prohibited zone which was marked by signs with arrows on them and where one of the signs had become slightly turned from its original position?

3. Have you ever had a visitor to your city receive a ticket for parking where the sign read, "No Parking Here to Third Street"? His complaint was, "How was I to know where Third Street was?"

It is our guess that you will answer "yes" to all three of the above questions. Any method to set the motorist straight on parking restrictions and eliminate all such complaints would certainly provide a great relief. *Here is how Detroit did it.* Complaints have been reduced from 15 and 20 a day to absolutely none within the last four years.

Mr. Harger is Director, Traffic Control Division, Traffic Engineering Bureau, City of Detroit.

The Detroit System

FIG. 1
This illustrates a simple double faced sign bearing the same message on both sides.

The system used is one in which a double faced sign is employed. Each sign has a message on each side and is suspended freely from a hanger at right angles to the curb line. If the same message is used on both sides of a given sign it is called a simple double faced sign (see Figure 1). If the sign has a different message on either side it is called a double message sign (see Figure 2).

This latter type of sign is the key to success of the system and is used at points where the parking restriction changes. Ever since parking signs were first used there has existed the problem of how to clearly designate a change in restrictions within any one block. The double message sign does the trick. To add emphasis to the fact that this particular sign denotes a change in restrictions, a small trailer sign bearing the same message on both sides and reading "This Side of Sign" is attached below the main sign.

The theory behind the system is quite simple. No matter where a mo-

torist may park in a controlled area, both the sign in front of him and back of him will convey the same message. He can't make a mistake as to the restrictions applying to the space which he occupies. All alibi possibilities are eliminated.

FIG. 2
This shows both sides of a double faced double-message sign which has a different message on each side of the sign. The side facing the motorist indicates the restriction applying to his space.

Actually, there is one deviation from this theory and that is the use of the standardized message "Here to Corner". However, the use of this message should be kept to a minimum and should never be used for distances exceeding 125 feet or one third of the block, whichever is shorter. This practice eliminates the possibility of the motorist becoming confused as to which corner is referred to.

One big advantage of the suspended double faced sign is the fact that considerably less signs are needed to do a given job. This is especially true in signing long continuous restrictions. It is the practice to install such signs 200 feet apart. This means that wherever a motorist may park, he has a sign within 100 feet of him. To obtain the same effect with the old style single faced signs it would require a sign every 100 feet. A big saving is evident.

Summary

The basic principles of this parking sign system may be summed up as follows:

First, the main feature is the double faced sign installed at right angles to the curb.

Second, the double message reading at points of restriction changes eliminates confusion and alibis on the part of the motorist.

Third, a considerable saving is realized in the reduction of the number of signs required.

And last, but not least, it works. Both the public and the police have accepted and readily understood the system.

Tools of this type make traffic control a pleasure.

ARMY TEST RESULTS GIVEN

Recent war department tests indicate that, in addition to a minimum "reaction distance" of 22 feet and a minimum "braking distance" of 23 feet at 25 mph, the make, size, or type of vehicle had little bearing on results except that the heavier vehicle, despite the increased traction, carried farther due to the momentum of the larger mass. The type or kind of brake (air, mechanical, or hydraulic) was no factor, as all types were used in the test and the variation was negligible. Many of the drivers were not fast thinkers and, therefore, the reaction distances were somewhat higher in these tests than those normally considered to be the average. Tests were of the "alerted" type, that is, a driver was told beforehand that at a given signal, while driving at 25 mph, he was to make an emergency stop.

Safety, An Element of Design

by H. E. HILTS, *Deputy Commissioner*
Public Roads Administration

BUILDING safety into a highway is a joint responsibility of three administrative state groups who may well always be in liaison as a traffic safety commission. These groups are (1) the motor vehicle administrators who are concerned with driver licensing, vehicle inspection, and regulatory measures affecting highway safety. (2) the police who execute traffic enforcement policies, and (3) the administrative officials of the state highway departments, the engineers of which are charged with maintaining the highways and streets, with traffic operation and control, and lastly with the design and preparation of the geometric and structural plans for all of the physical elements of the highway. These engineers should make use of facts developed by the engineers who design the vehicles and their accessories.

It is essential to maintain close and continual cooperation between the last four groups—the maintenance engineer, the traffic engineer, the design engineer and the automotive engineer.

The maintenance engineer usually has segregated annual costs of maintenance for all of the items within the right of way lines. His detailed analysis of maintenance costs for such elements as surface, shoulders, ditches, culverts, bridges, signs and signals establish criteria that should be considered in the over-all picture of service value as related to first cost, annual costs and life of the improvement. Without proper maintenance the safety inherent in a highway cannot be utilized.

The traffic engineer is usually responsible for the control and operation of traffic. His concern is in such details as actual speed and volume of traffic, placement of signs, signals and pavement markings, diagnosing the accident experience on the system, studying mechanical conditions of vehicles and their operating characteristics and studying driver behavior.

Through liaison the design engineer must be thoroughly conversant with the maintenance, traffic and automotive engineers' recommendations. He is responsible for the structural design and layout and usually, unfortunately, works on a "mass production" basis. His design standards should be kept as near current as possible and should always be subject to revisions suggested by the experience of the staff. An intimate correlation must be established and maintained between these four fields of highway work so that the design of the improvement will reflect utility and safety at reasonable cost.

Through recent discussions with foreign engineers we in the Public Roads Administration have been increasingly aware of the value and importance of the established design standards and practices used in our country. They are being studied, reviewed and used in many parts of the world. From our current studies we are disturbed that some of them, only a few years old, are already somewhat outmoded in the light of new data or conclusions.

The control values used in our design standards and practices are generally the results of compromises. They represent careful weighing of available data. There is considerable background of research for some of these

values, three of which are discussed here in detail. New research has verified many deduced values but there still remains a wide field for research verification or modification of values in light of new data.

Width of Traffic Lanes

Studies of transverse position of vehicles have proven that the body and edge clearance for vehicles meeting oncoming traffic are critical factors in the determination of adequate pavement width. Drivers of passenger cars desire a clearance of 5 feet between the body of their car and the body of the vehicle in the opposing traffic stream. For traffic consisting only of passenger cars this clearance can be obtained on pavements at least 22 feet in width. For mixed and truck traffic a 24-foot pavement is needed.

On two-lane pavements, 18 feet wide, 34 per cent of the drivers of passenger cars encroach on the left lane when uninfluenced by other traffic. When meeting oncoming vehicles, a suprisingly large number, 11 per cent of the drivers of trucks and 5 per cent of the drivers of passenger cars fail to keep their vehicles within the proper traffic lane. The percentage decreases with an increase in pavement width, only one per cent of the vehicles encroaching on the left lane when meeting other vehicles on 24-foot pavements.

The special traffic studies made by the Public Roads Administration in cooperation with several state highway departments show an increasing corollary in accident experience. There is a tendency for drivers to accept the narrower pavements as adequate for high-speed driving as readily as they accept the pavements of more liberal width. For example, a survey made of the speeds of a large sample of free-moving passenger cars on 18-foot pavements showed their average speed to be 44.9 miles per hour. On 20-foot, 22-foot, and 24-foot pavements, similar samples of free-moving passenger cars averaged 43.5, 48.1, and 43.4 miles per hour respectively. From this it appears that drivers are willing to accept the hazards of operation on narrow pavement without materially reducing their speed. The result is shown in the Interstate Accident study as follows:

Pavement width	Accidents per million vehicle miles
Less than 18.0′	5.2
18.0′ to 19.9′	3.8
20.0′ to 22.9′	3.5
23.0′ and over	3.4

Signs

Under certain conditions it is necessary to convey to the highway user special messages that affect or control his behavior. Until we can make much greater use of electronics, the only adequate way to transmit these messages is by means of signs. The traveler must be warned of dangerous conditions at particular points on the highway, especially where the hazards are unexpected or not too obvious. He must be informed of traffic regulations, the application of which might not otherwise be apparent, and, finally, he must be given directions as to routes and destinations. Each of these types of messages is, in its place, absolutely necessary to the safe and efficient operation of the highways.

Uniformity of sign design has been achieved to a larger degree. It cannot be said, however, that signs are everywhere adequate for the purposes they are intended to serve. Much is still to be learned about the legibility of signs, and the reaction of the vehicle driver to them, as affected by their size, position, and application.

Highway improvements reduce hazards, but often create new ones by making higher speeds possible. Modern high speeds require signs of a size undreamed of 20 years ago—or perhaps now, for that matter. Regulatory signs, too, must be adapted to the times. Speed limits, varying according to circumstances, can be imposed only by the use of signs, and the increasing need for roadway space for moving vehicles has multiplied the need for parking signs. Complex intersections designed to expedite traffic and eliminate vehicular interferences, together with divided highways and one-way roadways, have made adequate directional signs more indispensable than ever, if the traveler is to keep on his course.

The new manual on Uniform Traffic Control Devices makes numerous changes in details of sign standards but retains the basic elements that help in recognizing signs by shape, color, and position.

Highway signs are not simple accessories to be scattered around as needed after a highway has been completed, or perhaps after it

CENTER LINE

Latest "middle of the road" definition is "centerline" (one word) as meaning the geometric center of a street or highway as distinguished from "center line" (two words) which identifies the painted stripe on the centerline.

has been opened and things have gone wrong here and there. Signs should be regarded as an essential adjunct in highway design, and as such they should be included in the original plans. We should know where guidance and control are going to be required, and should provide accordingly.

Center Line Markings

Highway markings are used for the guidance of traffic, principally to keep vehicles safely in the traveled way and in proper lanes. Their chief use is in center lines, lane lines, and similar guide lines. For regulatory purposes special markings are used to indicate zones in which overtaking and passing are prohibited.

The following results have been obtained by a recent analysis of data collected on level tangent highway sections with and without center line markings, to determine the effectiveness of these lines in keeping vehicles in their proper lanes:

1. Center lines increase the effective pavement width about one foot for free moving vehicles and one-half foot for vehicles meeting oncoming traffic.

2. On 18-foot pavements with center lines about 12 per cent of the free-moving passenger cars travel partly on the wrong side of the center line; whereas 56 per cent or nearly 4½ times as many encroach on the wrong side of the road when there is no center line marking. Corresponding ratios between the percentage of vehicles on the wrong side of marked and unmarked center lines were also found for 20, 22 and 24-foot concrete and bituminous pavements.

3. On 20-foot pavements with center lines, the number of vehicles that encroach on the left-hand lane when meeting oncoming traffic is usually about 3 per cent. However, without a center line marking this figure averages about 6 per cent which includes an average of 12 per cent of the meeting between passenger cars and trucks.

4. Clearances between the bodies of vehicles meeting each other are less when the center line is not marked than when it is marked. For example, on 18-foot pavements, 90 per cent of the passenger car drivers that meet oncoming traffic allow a transverse clearance of less than 3 feet with the oncoming vehicle, which is considered the minimum clearance with any degree of safety as compared with 64 per cent of sections with marked center lines. The corresponding figures for 24-foot pavements are 20 per cent without the marked center line and 1.5 per cent with the marked center line.

It is in the field of two-and three-lane highways that standardization of pavement markings is particularly necessary. If no-passing regulations are to be enforceable, the regulatory markings must be quickly recognized and understood by everyone. A recent survey of the 48 states showed nearly a score of different types of no-passing markings used in conjunction with center lines. The difficulty in standardizing such markings lies in the need for indicating no-passing zones in opposite direction independently. This has usually been accomplished by laying down a special "barrier line" on the right of the center line, as viewed by the traffic that is to be governed by it. Such a barrier line can be distinguished from the center line either by form, or by color, or both. The center line can be continued through the no-passing zone, with a barrier line on one or both sides of it, or it can be discontinued, and a double line used, of which the right-hand line (as viewed by the driver) is of either barrier line or center line design, depending on whether passing is prohibited or permitted to traffic in his direction. After two detailed polls of opinion, the Joint Committee responsible for revising the Manual on Uniform Traffic Control Devices has proposed a broken white center line for two-lane roads with a solid barrier line in no-passing zones, which may be white or yellow, though yellow is recommended. It is hoped that this choice will be acceptable to most of the states, and that we shall soon see an end to the almost chaotic variety that now exists.

In conclusion, it is hoped that this short presentation on some elemental facts of engineering design practices for safe operation on highways will hit a responsive chord. Only by a practical application of the use of all developed factual information can we hope to strive for the Utopia of informed, responsible driving on well-engineered highways.

Condensed from a paper given March 5, 1947 at the Utah Engineering Conference.

ARMY ACCIDENT REPORTS ARE MORE COMPLETE

More complete reporting rather than an increase in motor vehicle accidents is believed to be the cause for the higher accident rate per hundred thousand miles at military installations in the United States, according to the 1946 annual report of the army's accident prevention program recently released by the War Dept.

Up 24 per cent in January over December, the report contends that four unsafe driver practices are responsible for more than half of all the army's motor vehicle accidents. These practices are listed as "speeding", "following too close", "unsafe backing" and "assuming right of way".

STATE BANS RURAL BILLBOARDS

Construction of advertising billboards in residential or rural areas was barred in Massachusetts recently by act of the state legislature.

New billboards will be permitted only in business sections under the law reported to be the first such statute in the country. The law is based on the legislative decision that the public has a right to more than transportation when it builds highways, and that obstruction of natural scenery with advertising billboards infringes on that right.

Pedestrian Subways In Los Angeles

by LLOYD ALDRICH AND RALPH T. DORSEY, *Member ITE*

AN IMPORTANT development in the safer use of streets and highways by people afoot has been the construction of pedestrian subways. In many communities the first pedestrian subways were "school tunnels", built under highways at hazardous school crossings.

The history of this development in Los Angeles probably parallels rather closely beginnings in other cities.

In 1918, two such subways were constructed in Los Angeles which passed both under an interurban railway and a heavily traveled highway in front of a large school. The beneficial effect of these subways soon became evident. They reduced the hazard to children, relieved the anxiety of parents, and eliminated much annoyance to motorists who had frequently found it necessary to slow down or stop at this crossing.

In 1924, after several small school children had been seriously hurt in attempting to cross Sunset boulevard at a large primary school the city council financed the construction of a subway at that location. This subway not only accomplished the benefits already mentioned, but saved the salary of a traffic officer who had been stationed at the school.

Popular demand then arose for more subways and resulted in the voting of a $350,000 bond issue for their construction.

Forty subways were financed solely by this fund and several others were partly financed by it.

Seventeen subways were built by city appropriation or by special assessments as part of large paving projects and sixteen were financed solely by school funds under the control of the board of education. Five were financed half by the city and half by the board of education. Three were financed with funds furnished by the federal government. Twelve were financed as P.W.A. projects, the federal government paying 45 per cent of the cost, and one was financed by the county.

This makes a total of 94 which have been built within the city limits.

When a general program for the construction of pedestrian subways is launched it is necessary in order to obtain maximum benefit from the expenditure to give careful attention to the selection of sites. This can be done by close cooperation involving the traffic engineer, the board of education and the city engineer.

In Los Angeles pedestrian subways are not constructed at crossings where stop and go signals have been installed or are in prospect.

Must Be Used

School children in Los Angeles are required by school authorities to use the subways, while adults will, in spite of laws to the contrary, cross the street on the surface. The average use of the subways by adult pedestrians is 15 per cent with a maximum at some points of 75 per cent. There have been three cases in which an adult pedestrian was killed by an automobile while walking across the street over the roof of a pedestrian subway.

Accident figures indicate that certain crossings in Los Angeles are still in urgent need of pedestrian subways or overhead crossings even though the number of pedestrians which use the crossings is small, because the boulevard crossed is so situated that the speed and volume of automobile traf-

Mr. Aldrich is city engineer and Mr. Dorsey, traffic engineer, of the City of Los Angeles.

School Pedestrian Subway
Sunset Blvd. and Micheltorena, Los Angeles.

fic are both high. Evaluation of the hazard will require considering not only pedestrian traffic counts and automobile traffic counts, but also the average speed of the automobiles, the sight distance for both pedestrians and autoists, the width of the roadway, the slippery condition of the pavement when wet, and some other factors.

The scientific weighing and combining of these factors to determine relative hazards is a complex study which would be difficult to put on a sound mathematical basis.

Design Is Standard

Design features of pedestrian subways in Los Angeles have become well standardized through experience. The interior width, except in unusual cases, is 6 feet and the clear height from 7 feet to 7 feet 3 inches. These dimensions seem very satisfactory. The floor is crowned 1½ inches at the center so that water will run to the sides and be collected in a sump which is built as a separate compartment recessed in the side wall and extended below the floor level. The problem of draining these sumps is of interest. When a suitable storm drain is near by the sump can be connected to it, but in many of the first subways sumps were connected to sanitary sewers in absence of a storm drain.

Because sewers are overtaxed and sewage often overflows into the street through manholes, it has been found necessary to discontinue connecting sumps to sanitary sewers. In such cases they are drained by pumping up into gutters.

The first pumps used were eductors operated by water jets connected to the city's water supply pipes. These were later condemned as a violation of local regulations because city water mains are not always under pressure but at times are under partial vacuum. This suction in a water main can occur when a number of fire engines are pumping water from it or when the water is shut off and the main is drained for repairs.

At such times water from the pedestrian subway sumps might be drawn through an eductor into the city's water supply system, resulting in serious contamination. Hence a larger pump chamber and an electrically driven pump are now used.

Interior Finish

The interior finish of the subway is a very rough spatter dash mortar coat on which it is impracticable to write or draw with pencils or crayons. It has been surprising how many destructive acts have been committed by users of subways. Glass over lighting recesses was continually **broken** and so a new design of light recess box having a heavy wire mesh face instead of a glass face was adopted. On account of frequent theft of the bronze doors to switch and light boxes, a galvanized cast iron has been substituted. Cast iron gratings over drainage inlets were frequently removed or were sometimes broken by pounding with a heavy implement. They are now fastened down with screws and the screw head slots are filled with solder. The weight of the manhole covers over the sumps in the older style subways was increased from 79 pounds to 130 pounds to make them harder to remove. In the later subways manhole covers in the subway floor are eliminated altogether, access to the sump being by a door in the sidewalk.

Friction Walk

During the last six years cast metal safety treads 4 inches wide containing an abrasive to prevent slipping have been used to protect the noses of stair treads.

Subway costs run from $4,000.00 to over $10,000.00, and average $8,000.00 each.

As against 94 pedestrian **subways** there are only three existing or authorized pedestrian **overhead** crossings in Los Angeles. The principal reason is that while the stairways for pedestrian subways have a vertical height of about 9 feet, stairways for overhead crossings require a height of about 15 feet. This is because structures over a **highway** require a minimum clearance of 14 feet.

The obstacle presented by the high stairways of overhead crossings would, under ordinary circumstances, reduce their use to a figure materially below that of pedestrian sub-

Philadelphia Starts O and D Survey

by ROBERT A. MITCHELL, *Member ITE*

ON MARCH 3, 1947, the largest origin and destination transportation survey ever undertaken under the sponsorship of the Public Roads Administration, was begun in the Philadelphia metropolitan area with the highway departments of the states of Pennsylvania and New Jersey and the Bureau of Traffic Engineering of the City of Philadelphia cooperating. The area of the survey includes the cities of Philadelphia and Camden with the adjacent suburban areas of Pennsylvania and New Jersey comprising approximately 210 square miles and a population of 2,800,000 persons.

The survey will be conducted in accordance with the procedure established by the Public Roads Administration. It will include an internal survey, external survey, truck and taxi survey, tabulation and analysis.

H. G. Van Riper, highway planning engineer, is in direct charge of the project for Pennsylvania with Sigvald Johannesson, director of the division of planning and economics responsible for New Jersey's part of the program. Mr. Van Riper's assistant, Paul D. Muffley, (Assoc. I.T.E.) will handle the technical details of the survey. It is estimated that the entire survey will cost $240,000 with $210,000 of this for the Pennsylvania side of the program. The City of Philadelphia has appropriated $55,000 to the Bureau of Traffic Engineering for Philadelphia's participation in the survey.

Main headquarters have been established in an office building in the central business district of Philadelphia. District offices will be established in five other sections of Philadelphia and two district offices in the counties surrounding Philadelphia.

It is estimated that 170 persons will be used on the project, 50 administrative personnel, 60 people for the internal interviews and 60 for the external survey. The field work began in May and is expected to continue for six months in order to sample spring, summer and fall conditions.

Mr. Mitchell is Chief, Bureau of Traffic Engineering, City of Philadelphia.

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ways. However, there is at least one situation in Los Angeles which calls for an overhead pedestrian bridge. This is along a part of Ramona Boulevard where the highway is bordered by a large drainage channel which cannot reasonably be moved and which makes a subway entrance impracticable. Here a neat looking concrete rigid frame overhead bridge has been constructed at one site, and two more are in prospect. On account of the dense, high speed traffic on this boulevard the percentage of use of the overhead bridge is high.

Permit Damages

One subject which should be mentioned is the attitude of property owners toward pedestrian subway entrances fronting on their property. Usually they do not like them. For a number of years courts denied damage to such property owners if the subway entrance still left them reasonable sidewalk facilities. Recently, however, it has been the practice to allow damages to owners on whose frontage a subway entrance is constructed.

With overhead bridges the damage situation is worse, since the ascending stairway to a bridge is a worse obstruction in front of property than the stair well to a pedestrian subway.

In considering pedestrian crossing for a state highway in Los Angeles it developed that highway officials of the state had had some unsatisfactory experiences with pedestrian subways and were opposed to their use. In outlying places it is obvious that people will misuse such subways and keep them in an unsanitary condition. It is probable that there is a greater chance of robbery or other molestation of persons in a pedestrian subway than out in the open, unless the subway is located where it is in frequent use.

It has been proposed to put gates and locks on some of the Los Angeles subways leading to schools and keep them locked at night, but the majority opinion has been against this.

In general, pedestrian subways have been received with favor in Los Angeles and there is a strong demand for additional ones, especially at schools.

Internal Survey

The internal survey will consist of interviews in every 20th dwelling unit in the area or a total of approximately 35,000 homes and apartments. In general, the questionnaire used in the survey will be similar to that used in previous surveys of this type. It is believed, however, that this is the first one which is designed to obtain detailed information on the travel habits of people using subways, suburban trains and ferry boats.

The mass transportation travel habits of the people is considered a major source of information as far as the city is concerned. This is important where such a large majority of the citizens is transported by these facilities, including high speed transit service and suburban trains. Philadalphia is now preparing plans for the extension of its subway and elevated lines and it is only by obtaining such information that we can be assured that these extensions will follow the proper routes to serve the greatest number of persons.

There will be 89 locations around the periphery of the area where teams of interviewers and state police will be stationed to stop vehicles entering and leaving the cordon for interviewing the drivers. It is estimated that approximately 175,000 vehicle drivers will be interviewed during the course of the external survey. The size of the survey can be better realized when it is known that over 150 cities and towns or villages are included within the area.

The interviewing and sampling of trucks and taxicabs will be handled the same as was done in other cities where similar surveys have been made, all in accordance with the PRA manual. There are approximately 50,000 trucks and 1600 taxicabs in the area and a 10 per cent sampling will be obtained.

Control Points

In order to check the completeness and accuracy of the interview data both a screen line and control points will be established. The Schuylkill river which practically bisects the population of the area will be used as the screen line. There are 14 bridge crossings where ground counts will be made. The Delaware River bridge, the Tacony-Palmyra bridge and the Pennsylvania Railroad ferries across the Delaware river between Pennsylvania and New Jersey will be control points.

There has been very favorable public reaction in Philadelphia to the survey and it received the approval of the important civic, merchant and research groups that are always so interested in public affairs. Only two "sour notes" have been sounded, one bemoaning the fact that the survey should have been started a year ago and the other questioning the value of information that, according to past performances, might not be published until 18 months after it was obtained.

Philadelphia is in the midst of a large program of new highways and high speed transit facilities which will cost over one hundred million dollars. It would certainly have been helpful if the survey had started last year and it is vital that the results of the survey now underway be made available as soon as possible. The state highway department will make every effort to see that this is done and if possible a way will be found to analyze special data and make it available to the city planners soon after it is collected rather than wait until the final report is completed.

CITIES PAY STATE GAS TAX

The Minnesota supreme court ruled recently that municipalities are not exempt from the four-cents a gallon state tax on gasoline used by city-owned and operated vehicles.

Face-Lifting the Uniform Manual

by WILLIAM G. ELIOT, *3d, Member ITE*

TRAFFIC ENGINEERS may pride themselves on their broadening profession and their freedom from the impedimenta of tradition, but these same advantages impose on them the responsibility for creating new standards and acceptable techniques. The yearbook of the Institute of Traffic Engineers lists many standing and special committees, nearly all concerned with standards of one sort or another. Among "cooperative activities" there appears the Joint Committee on Uniform Traffic Control Devices.

To this important committee, representing, in addition to the Institute, the American Association of State Highway Officials and the National Conference on Street and Highway Safety, is assigned the responsibility for periodic review and revision of the Manual on Uniform Traffic Control Devices for Streets and Highways, the official and generally recognized standard covering highway signs, pavement markings, traffic signals, islands, and similar devices used for the guidance, warning, or regulation of traffic. Its beginnings antedate the founding of the Institute by some years and it was not until 1942 that the committee representation was logically broadened to include the Institute.

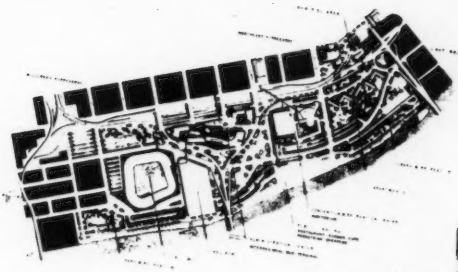
National standards for traffic-control devices go back to 1925, when the American Association of State Highway Officials named a Joint Board on Interstate Highways to lay out a system of interstate routes and to prescribe uniform markings for such routes. In 1927 there was published the first "Manual and Specifications for the Manufacture, Display, and Erection of U. S. Standard Road Markers and Signs". This manual received prompt and wide acceptance, but it dealt only with highway signs, and only with their rural applications. Meanwhile traffic control in cities remained as confused as ever, and the National Conference on Street and Highway Safety had been glad to accept an offer of the American Engineering Council to prepare specifications for traffic control devices in cities. The council's recommendations, adopted by the Conference in 1930, set up a system of signs closely agreeing with those of the American Association of State Highway Officials, but also proposed standards for traffic signals, pavement and curb markings, and safety zones.

Appoint Committee

To reconcile differences and to establish a single national standard the American Association of State Highway Officials and the National Conference on Street and Highway Safety in 1931 appointed the Joint Committee on Uniform Traffic Control Devices to develop a new manual. In 1934 the Joint Committee was ready with a preliminary draft of its Manual on Uniform Traffic Control Devices which, after further revision, was published in 1935 as an American Standard, approved by the American Standards Association.

For the first time, this manual provided a complete set of standards for traffic-control devices for general application. It could not, of course,

Mr. Eliot is secretary of the subcommittees on signs and markings, Joint Committee on Uniform Traffic Control Devices. He is also Highway Engineer, Public Roads Administration.



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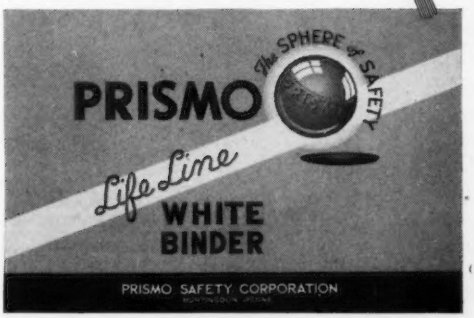

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answer every question or meet every need, nor could it remain a static thing. Standards must inevitably keep abreast of technological change. By 1938 it was necessary to call on the Joint Committee again to bring the manual up to date, largely because of progress in the field of traffic signals. A set of amendments was prepared as a supplement to the original manual. By 1941 stocks of the manual were exhausted, and another reprinting of the old edition seemed inadequate. Problems of wartime traffic were looming up, especially the altogether new possibility of having to move traffic under "blackout" conditions. Once more the Joint Committee was revised, this time reorganized to include equal representation from the Institute of Traffic Engineers as well as the two original sponsors. The "War Emergency Edition" of the manual, published at the end of 1942, was basically a condensed version of the previous manual, modified only to the extent that it seemed practical to adapt traffic-control devices to blackout conditions.

Revision Needed

It soon became apparent that with the end of hostilities there would be great need for a new up-to-date postwar edition of the manual, and the Joint Committee was reactivated as early as 1944 to start work on such a revision. This time the committee could proceed with a free hand.

The Joint Committee was in complete agreement that the manual should be entirely rewritten, not merely patched up. The old manual, for example, had been severely criticised for the arrangement of its contents. To find all the specifications for any particular control device it was necessary to look in as many as four or more different places, with little or no cross-referencing. It was decided that the new manual should treat each device fully and, so far as practicable, independently, in one place. It was further agreed that illustrations should be appropriately distributed through the text, not grouped at the back of the book to reduce printing costs. Finally, it was understood that all standards and specifications were to be critically examined, and changed wherever justified by experience or research—in other words, that the manual was to be the best job that could be produced, regardless.

The Institute of Traffic Engineers has made a large and creditable contribution to the work of the Joint Committee on Uniform Traffic Control Devices which is revising the Uniform Manual. Officially the committee includes seven representatives of the Institute, but actually 16 of the 21 members of the committee, as well as the subcommittee secretaries assigned by the Public Roads Administration, are Institute members.

Each major subdivision of the manual—signs, markings, signals, and islands—was assigned to a subcommittee with a secretary provided by the Public Roads Administration. As a first step each subcommittee drew up a detailed questionnaire and circulated it to all state highway departments, to selected cities, and to numerous traffic engineers, asking for information and comments as to current practices, and recommendations for changes. While the replies revealed general acceptance of the basic standards of the old manual—as was to be expected—there were many suggestions for improvement and some very clear trends were evident.

In addition to its organization meeting, the full committee met for three-day sessions in December 1945 and July 1946, to consider drafts and recommendations of the subcommittees. Final decisions were reached on nearly all points, and the several parts of the text were referred to the subcommittee secretaries and an Editing Subcommittee to prepare a final draft for the approval of the Joint Committee and its sponsoring agencies. This approval draft, completed in February of this year, has been distributed widely, and a large variety of criticisms has been received. Many suggestions for editorial improvement will be adopted. Scattered objections to particular specifications, however, must generally be regarded as minority viewpoints, not warranting a reconsideration by the Joint Committee.

Few Changes

Basically the standards recommended by the committee are little changed from those of the previous manual. The changes are, for the most part, only refinements, such as simplified messages or symbols, improved signal controls, or adaptations necessitated by progress in highway design. Some of the most significant changes may be briefly discussed as follows:

1. All warning signs (with a few such exceptions as railroad crossing signs) are to be "diamond"-shaped. Heretofore warning signs have been either diamond-shaped or square, depending on whether they were, respectively, "slow-type" signs requiring a reduction in speed because of highway conditions, or "caution-type," requiring alertness and care, but not necessarily slower speed. The distinction has never been too clear, and certainly it has meant little or nothing to the public. Several states have advocated exclusive use of the square, usually on the ground that the square will accommodate a

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larger message or symbol. It was the view of the committee, however, that the diamond shape has a definite advantage in its distinctive outline, which more than offsets the possible loss of legibility. For some signs the committee found that the diamond shape permits a larger message than the square.

2. Large destination signs, distance signs, and information signs (other than route markers and their auxiliaries) may be optionally designed with a black background and white lettering. There has been a growing demand for such signs, which have been successfully used by many highway departments. Legibility tests conducted by the Ohio Department of Highways and the Public Roads Administration in 1944 showed that white lettering was more legible than black, other things being equal, but the black-background signs were too inconspicuous in daylight unless they were made extra large. The committee felt that a reasonable compromise was reached by permitting the black background only on large signs of the types mentioned.

3. A new design is established for the "Advance Turn Marker." Heretofore the manual has specified that on the approach to a turn at an intersection on a numbered route there shall be erected a standard route marker above an auxiliary marker showing an "L" or an "R" to indicate that the turn is to left or right, as the case may be. This marking has not been altogether satisfactory, as not every driver can make a quick mental translation of the letter into a change of direction. A special poll of the state highway departments revealed two schools of thought, almost evenly divided, one favoring a horizontal arrow and the other sticking to the old marker, generally on the argument that a horizontal arrow should be reserved for use only at the actual point of turning. The Joint Committee adopted a compromise that seems to have all of the advantages and none of the disadvantages of either scheme, an arrow with its shaft extending vertically upward and then bent to right or left. This, it is believed, clearly indicates both the direction of the turn and the fact that the turn is still a short distance ahead.

4. In the field of pavement markings, the principal change, arrived at after much discussion and two special polls of the state highway departments, is the substitution of new specifications for center lines and no-passing-zone markings in place of those adopted by the American Association of State Highway Officials in 1940. Whereas the old standard permitted on two-lane roads either a white or a black center line, of either continuous or dashed type, with a solid yellow "barrier" line to mark no-passing zones, the new specifications definitely required a dashed, or broken, white center line but permit the solid barrier line to be either yellow or white, preferably the fomer.

5. Detailed specifications for the design and placement of "delineators" are now to be found in the manual.

6. New warrants for traffic signal installations based on a detailed survey of current pactice, have been incuded. These for the first time recognize the different needs of urban and rural areas.

7. The location of traffic signal faces at an intersection is not as rigidly prescribed as formerly, emphasis now being placed on the need for adequate visibility under all circumstances. Differences in intersection design, turning movements, approach speeds, pedestrian traffic, and even the competition of other lighting, prevented agreement on any single standard for location. For urban installations, however, it is definitely specified that there shall be at least two signal faces visible from each approaching street.

8. A full discussion of the relative advantages of fixed-time and traffic-actuated signals under differing circumstances has been added as a guide to the selection of equipment.

9. Increased emphasis has been given to the approach-end treatment of islands, by pavement markings, signs, signals, "jiggle bars," and sloping "prows," or combinations of these devices. Rotary traffic islands and similar features that are to be regarded as elements of highway design rather than traffic-control devices, have been omitted from the new manual.

There are a great many other ways in which the manual reflects modern advances in the techniques of traffic control. Increased emphasis is given to the use of enlarged or oversize signs, for greater effectiveness. Reflectorization or illumination is specified for all regulatory and warning signs, except pedestrian and parking signs. The desirability of reflectorizing certain pavement markings is also suggested. A great deal of discussion is given to traffic signal equipment, controls, and operation, although specifications for the design of signal heads and the meaning of the signal indications remain unchanged.

The "rounded" lettering for highway signs, adopted by the American Association of State Highway Officials in 1945 is, of course, included among the standards of the new manual.

The average motor-vehicle driver, accustomed at best to a considerable local variation in traffic-control devices, will probably be wholly unaware that there has been another long step made in improvement and standardization of traffic control. To the traffic engineer, however, the new manual will be an indispensable source of guidance in the application of standard control devices. If the demand for information about the contents of the new manual is any measure of the degree to which its standards will be adopted, we are going to see accelerated progress toward uniformity in the near future. A Subcommittee on Research has been set up by the Joint Committee to promote and correlate investigations into the effectiveness of traffic-control devices, as one means to a still greater improvement in future editions of the manual.

The new manual has already received the official approval of the Institute of Traffic Engineers, and is now being voted on by the state highway departments in accordance with the procedure of the American Association of State Highway Officials for approving such standards. Prompt approval by the National Conference on Street and Highway Safety is also expected. The manual will be submitted also to the American Standards Association for adoption as an American Standard. Final editorial work and preparation of illustrations are being pushed along to make the manual ready for printing by the Public Roads Administration early this summer. Already there is a backlog of orders for many thousands of copies from organizations that are ready to underwrite a part of the publication costs.

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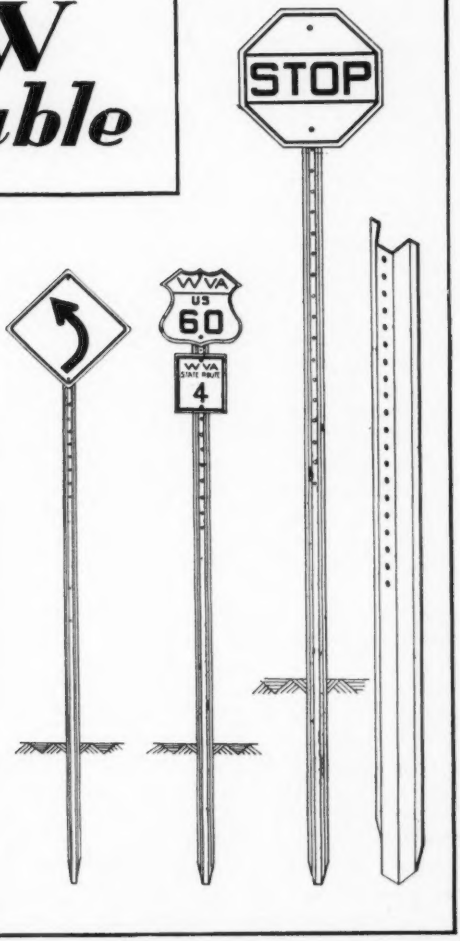

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"OFFICIAL CARS" ARE LOSING PRIVILEGES

Parking of "official cars" is one of the headaches in urban traffic administration, a survey conducted by Fred T. Fowler, traffic engineer of Portland, Oregon, reveals.

Questionnaires returned by twenty-six cities in every section of the nation indicated that traffic administrators are assuming a stricter attitude toward the uncontrolled parking of so-called "official cars" than was the case during the war period. Typical of the trend is Cleveland. There, government owned vehicles or privately owned cars used by government employees were given special parking privileges. These privileges have now been revoked.

The survey was prompted by the fact that parking of official cars in the central business area of Portland had become a burden which the limited curb facilities could ill afford to bear.

Portland in 1946 had 590 such official car permits outstanding, in addition to a large number of federally licensed vehicles exempt from parking meter fees. As a result of the study, this number has been reduced to 130 in 1947.

Only two other cities taking part in the study—St. Louis and Denver—indicated that unrestricted privileges are granted in the congested areas.

Half of the cities provide official car zones but several indicated these are being drastically reduced in number.

Excusing of parking tags received by official cars when on official business is the practice in nine of the twenty-six cities. Columbus indicated such excusing of tags is done "for good cause only", and Cincinnati excuses only on approval by the chief of police under strict rules which result in "surprisingly few requests of this kind"; St. Paul on police recommendation only; Milwaukee only "upon proper showing of necessity."

Two cities extend special parking privileges to doctors' cars, and one city to cars driven by news writers.

The following are typical comments accompanying the returned questionnaires:

Atlanta—"The City of Atlanta does not grant special privileges to anyone. We have had numerous requests from various military branches and have had the same old argument that you have to listen to. To date we have refused all and find it works much better."

Birmingham—"The laws of the City of Birmingham recognize no vehicle as an "official car." Governmental agencies of the federal government, state, county and city, are not granted any special privileges and must observe the parking rules and regulations, the same as any private citizen, and we do not have any "fixing" of traffic tickets for violations by any of these agencies or others. No parking permits of any kind or description are issued to any person regardless of who he is or what position he holds, including totally disabled cripples."

Buffalo—"There are no special favors granted in this city."

Milwaukee—"In our city no special parking privileges are granted to anyone, nor does the city of this department provide any special parking areas for 'official cars' of other government agencies. Whenever, because of an emergency, officials of governmental agencies find it necessary to park their cars in restricted areas or in violation of other parking ordinance provisions, we void any summonses which may be issued upon proper showing of necessity."

Providence—"No special privileges granted any public or government cars for parking in this city."

New Orleans—"Such special privilege parking to official cars and others is held to a minimum in the City of New Orleans and their number is being constantly reduced and discouraged."

Philadelphia—"We are gradually eliminating all such zones except for emergency cars of police."

Toledo—"No special privileges are officially extended. We have resisted all attempts to date, and they have been voluminous, to grant special privilege parking to any of the official and public agencies. To have done so, and to have avoided all discrimination, we would have had to assign about 35 per cent of all legal parking spaces to such purposes. The very numbers involved made it prohibitive in conserving the rights of the public to their own interests."

Contributed by Geo. W. Howie, Assoc. mem., I.T.E. assistant traffic engineer, City of Portland, Ore.

REFERENCE NOTES

Critical Clearance Dimensions of Passenger Cars

NAME	Overall Length (Feet)	Wheel Base (Feet)	Ctr. Rear Wheel to Rear Bumper (Feet)	Wheel & Size of Tire (Inches)	Ground to Lowest Points (Inches)	Turning Circle Average (Feet)	Overall Width (Feet)
1946 Chrysler—							
Crown Imp.—8 cyl.	19.6	12.1	3.8	7.50 x 15	7.0	48.2	6.3
Imperial—8 cyl.	17.9	10.6	3.8	7.00 x 15	6.8	41.6	6.3
Royal—6 cyl.	17.4	10.1	3.8	6.50 x 15	6.5	40.7	6.3
Royal—6 cyl., 7 pas.	18.9	11.6	3.8	7.00 x 15	6.8	45.0	6.3
Desoto	17.3	10.1	4.0	6.50 x 15	6.5	40.5	6.3
Desoto, 7 pas.	18.8	11.6	4.0	7.00 x 15	6.8	45.0	6.3
Dodge	17.1	10.0	4.0	6.00 x 15	6.5	40.2	6.3
Dodge, 7 passenger	18.6	11.5	4.0	7.00 x 15	6.8	45.0	6.3
Plymouth	16.4	9.8	3.8	6.00 x 16	6.5	39.3	6.1
1946 Buick—"40"	17.3	10.1	4.2	6.50 x 16	6.0	42.7	6.5
Buick—"50"	17.7	10.3	4.3	6.50 x 16	5.9	44.2	6.6
Buick—"70"	18.1	10.8	4.3	7.00 x 15	6.1	45.6	6.6
Cadillac 60S	18.7	11.1	4.6	7.00 x 15	6.3	48.3	6.7
Cadillac 61	17.8	10.5	4.4	7.00 x 15	6.6	45.7	6.7
Cadillac 62	18.3	10.7	4.6	7.00 x 15	6.4	52.8	6.7
Cadillac 75	18.9	11.3	4.7	7.50 x 16	5.8	48.8	6.9
Chevrolet-St. Mstr.	16.6	9.7	4.1	6.00 x 16	7.3	42.3	6.1
Chevrolet-Flt. Mstr.	16.6	9.7	4.1	6.00 x 16	7.4	42.4	6.1
Oldsmobile—66	17.0	9.9	4.1	6.00 x 16	7.2	41.9	6.3
Oldsmobile—76	17.7	10.4	4.4	6.50 x 16	7.1	42.6	6.3
Oldsmobile—70	17.7	10.4	4.4	6.50 x 16	6.9	45.9	6.3
Oldsmobile—98	18.0	10.5	4.5	7.00 x 15	7.1	46.0	6.5
Pontiac—25	17.0	9.9	4.2	6.00 x 16	7.7	42.6	6.3
Pontiac—26	17.5	10.2	4.4	6.50 x 16	7.3	43.7	6.4
Pontiac—27	17.0	9.9	4.2	6.00 x 16	7.7	42.6	6.3
Pontiac—28	17.5	10.2	4.3	6.50 x 16	6.3	41.7	6.4
1946 Lincoln	18.2	10.4	4.5	7.00 x 15	6.8	44.5	6.5
Mercury	16.9	9.8	4.0	6.50 x 16	7.5	41.0	6.1
Ford	16.5	9.5	4.2	6.00 x 16	7.5	41.0	6.1
1947 Studebaker—							
14A—Long Com.	17.4	10.3	3.8	6.50 x 15	6.1	42.9	5.8
14A—Commander	17.0	9.9	3.8	6.50 x 15	6.1	42.0	5.8
6G—Champion	16.0	9.3	3.8	5.50 x 15	5.9	42.9	5.8
1946 Nash—							
Ambassador 6	17.4	10.1	4.0	5.00 x 15	8.0	38.0	6.3
Nash "600"	16.6	9.3	4.0	4.00 x 16	9.0	41.0	6.3
1946 Packard—							
2100-1-11	17.4	10.0	4.2	6.50 x 15	6.7	42.0	6.3
2103-6	18.0	10.6	4.2	7.00 x 15	6.9	44.0	6.3
2126	19.7	12.3	4.2	7.50 x 16		52.0	6.3
1947—Kaiser							
Frazer	16.9	10.3	3.8	6.50 x 15	7.1	44.0	6.1

(Reproduced, in part from the April 1947 issue of Urban Land)

STOP DOING IT

New vacuum machi

now applies "Scotchlite" in 3½ minute

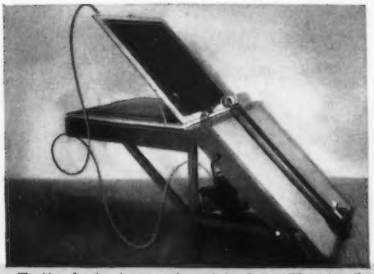
Wouldn't you welcome a sign surfacing process that would giv you the extra safety of over-all reflectorization and at the sam time save time and money?

Then listen to this: The new "Scotchlite" Vacuum Applicat completely reflectorizes any highway sign in just three and half *minutes!* It actually molds the reflective "Scotchlite" sheet every contour of embossed metal signs . . . pressurizes the sig and the "Scotchlite" to make a perfect, permanent bond.

Check through the few quick, simple steps shown here . . . an remember, this process gives you "Scotchlite" signs that lea into fiery brilliance at night in the headlight beams of approac ing cars.

You'll want all the information on the new improved "Scotc lite" Vacuum Applicator. Simply write to Dept. TE 67, Minneso Mining & Mfg. Co., Saint Paul 6, Minn.

TRY THE NEW VACUUM MACHINE METH



1 Here's the improved model of the "Scotchlite" Vacuum Applicator. It is open, ready for insertion of sign blank and "Scotchlite."

2 Embossed sign blank is placed on with special adhesive and then co sheet of "Scotchlite."

ITHE HARD WAY

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minute

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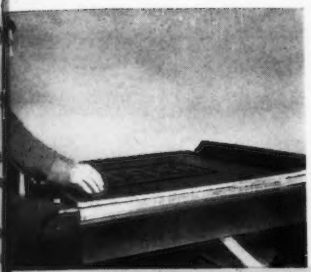
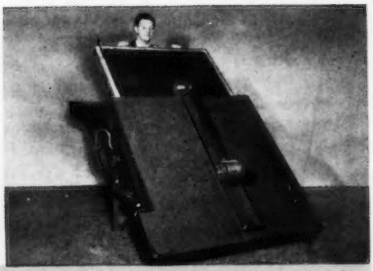
57, Minneso

E METH



ber diaphragm is lowered and air is exhausted. e how diaphragm is molded to embossed con- s of sign blank.



4 Vacuum unit is lowered into hot water bath for two minutes to activate the "Scotchlite" adhesive.

cotchlite" is now firmly, permanently bonded to gn blank. Vacuum process has eliminated air ubbles.

6 "Scotchlite" sign is now roller coated to make legend visible exactly as ordinary signs are done.

k is placed on p
ye and then cov

SCOTCHLITE
REG. U.S. PAT. OFF.
REFLECTIVE MATERIAL

In U.S.A. by **MINNESOTA MINING & MFG. CO.,** Saint Paul 6, Minn.
THE 3M COMPANY

Activities . . . .

YEARBOOK CHANGES

Paul L. Brewer
4801 Crockett St.
Galveston, Texas (new member)

Harold F. Hammond
Asst. Mgr., Traffic & Com. Dept.
U. S. Chamber of Commerce
1615 H St., N. W.
Washington, D. C.

Harold F. Nunn—resigned

C. G. Stoneburner
4631 Third Street South
Arlington, Va.

Edward J. Baumel
Chicago Park District
7037 S. Merrill Street
Chicago 49, Ill.

Major Harry D. Kamy
Transp. Corps
Stockton Gen. Depot
U. S. Army
Stockton 1, Calif.

Major Charles Beckenbach
3812 McKinley Street
El Paso, Texas

Mr. Robert S. Holmes
Executive Secretary
Institute of Traffic Engineers
212 Strathcona Hall
New Haven 11, Conn.

Chester C. Burdick
508 N. Grand Avenue
Lansing 30, Mich.

Thomas E. Willier
Traffic Engineering Dept.
City Hall
Houston, Tex.

John W. Zimmerman
T. E. Designer
Chicago Park District
Adm. Bldg., Burnham Park
425 East 14th Blvd.
Chicago 5, Illinois

William S. Canning
Engr. Dir., Keystone Motor Club
220 S. Broad Street
Philadelphia 2, Pa.

George J. Fisher
City Traffic Engr.
205 City Bldg.
Wichita 2, Kansas

F. W. Taylor
Box 584
Ann Arbor, Michigan

SECTION NEWS

NEW YORK SECTION

The second annual summer outing of the New York Section is scheduled at Les Williams' home at Pine Island, Rye, N. Y.

—o—

MICHIGAN SECTION

Minutes of annual meeting, Wednesday, April 30, 1947, at the Harmonie Society, 267 E Gd River Ave., Detroit:

Attending: H. M. LeRoy, A. J. Hanson, R. E. Harrison, O. M. Gunderson, J. C. McMonagle, F. A. Ronan, R. C. Harger, C. Glasgow, W. L. Potts, J. P. Buckley, J. L. Wehmeyer, H. G. Bauerle, T. McCarthy, J. J. Dobelek, A. W. Knoske, R. Shoemaker and A. F. Malo.

Mr. Dobelek was appointed to be in charge of the headquarters room at the Michigan safety conference, May 21st in the Detroit-Leland hotel.

Since most of the members will be attending the Michigan safety conference and will have occasion to get together in the headquarters room, it was decided not to hold a regular meeting in May.

The secretary was instructed to outline to the Fort Shelby hotel the requirements for the national ITE convention.

Considerable discussion was had of the tentative program for the national convention. Mr. McMonagle stated that this year's meeting would require an additional day in order to include a tour of a part of the motor industry. Copies of the program are being distributed to the Michigan members for their comments.

After a general discussion of finances, it was decided that the new president would be instructed to appoint a committee to bring in a plan on how to meet expenses.

As a last order of business, the following new officers were elected:

President, Ross Harger; Vice-President, Frank Eisenach; Secretary-Treasurer, Russell Harrison.

—o—

NEW SECTION FORMED

A new local chapter has just been organized known as the Mid-West section of the Institute of Traffic Engineers. This organization consists of I.T.E. members of the entire west, with the exception of the eleven western states Section area, with headquarters in Chicago The president of this new organization is Vic Hofer of the Chicago Park District, vice-president Stan Baker, Northwestern Traffic Institute, secretary-treasurer Matt Sielski, Director Safety and Traffic Engineering. At the first meeting officers were elected and by-laws were voted upon. The members attending the meet-

ing were: Vic Hofer, Harry Porter, Ralph Michel, Russ Newell, Stan Baker, Larry Kane, K. E. Williams, Matt Sielski, Bill Marston, Matthew Krag, Peter Page and Don Berry.

—o—

WASHINGTON SECTION

At the April meeting, the Engineers' license law was discussed by Wallace Braun. President Eliot appointed a committee of Wallace Braun and Bruce Greenshields to examine the proposed law in detail and to report to the Washington section.

John Mitton reported on the Engineers Club meeting of April 21. One dollar has been received from each of 658 members. The time for charter memberships was extended to June 30.

President Eliot read a letter received from "Who's Who In Engineering" indicating that members could be listed who had certain qualifications, among which was ten years of active practice.

Wallace Braun introduced the speaker of the evening, Mrs. Eleanor Kirwan, who gave a talk on public relations as it relates to traffic engineering.

FORM PARTNERSHIP

On May 1st the transportation engineering firm of Hawley S. Simpson (Mem.) becomes a partnership under the name of Simpson and Curtin. The firm will continue to maintain offices in Philadelphia, at 1405 Locust Street, specializing in transit labor relations, traffic and other management problems.

Prior to opening his own office, Simpson was research director for American Transit Association. During the war he was spokesman for the industry before the national and regional war labor boards. He is a past president of the Institute of Traffic Engineering.

Before joining Simpson in 1945, John F. Curtin was transportation engineer at the atomic bomb project in Oak Ridge, Tenn. He also acted as consultant to Petroleum Administration for War. Previously, he worked as transportation economist for American Petroleum Institute and was engineer-analyst on design of the Pennsylvania Turnpike. He is a graduate of the Harvard Traffic Bureau.

—o—

Stockton, Calif., has appointed its first traffic engineer, Deane S. Terry, who except for a tour of duty in the Army, has been manager of the San Joaquin Safety Council since 1940.

JOHN BEAKEY, PIONEER TRAFFIC ENGINEER, DIES

Hospitalized since wounded in the lung by a shell fragment July 2, 1944, during the allied invasion of France, Col. John S. Beakey, former Oregon state traffic engineer and member of I.T.E. died April 30 in Fitzsimmons general hospital, Denver.

Beakey, rated by state Highway Engineer R. H. Baldock as "one of the foremost traffic engineers in the United States," is credited by Baldock with setting up Oregon's original highway sign system. When he first became connected with the highway department Beakey was residing in Coos Bay, where he was office engineer in the district office. He moved to Salem in 1929 to take over the duties of state traffic engineer, a position that he held until December 16, 1942, when he enlisted for service in World War II.

Born in Portland, Oregon, March 9, 1900, Col. Beakey attended grade school in Seattle and Portland and at the time of enlisting for service in World War I was a senior at Jefferson high school in Portland. On receiving his discharge from the army Beakey entered Oregon State College, where he was a member of Lambda Chi fraternity. March 19, 1923, he was married to Fern Yexley, who survives him.

Surviving besides his widow are his father, D. J. Beakey, of Williston, N. D.; two daughters, Joan Beakey, a student at Oregon State college and Beverly Beakey of Salem; and a son, Jack Beakey.

ANNUAL MEETING PLANS

"Operating Characteristics of the Postwar Automobile" is one of many featured subjects slated for the ITE 18th annual meeting, October 1 through 4 at the Hotel Ft. Shelby, Detroit. This subject is tentatively scheduled to be given by Thomas J. Carmichael, engineer at the General Motors proving ground.

Divided into four technical sessions and the annual business meeting, the 1947 convention promises to offer a great variety of traffic engineering subjects designated to be of interest to federal, state and city representatives. Highlight of the meeting is expected to be an all day tour of Detroit's manufacturing plants.

Program committee members in charge of the annual meeting are urging members to make plans now to attend the Detroit conclave.

I T E PERSONALS

EDGAR F. COPELL (Mem.) president of the Massachusetts Safety Council, has announced the resignation of W. Burke Smith as general manager of that organization.

—o—

TOM WILLIER (Mem.) has returned to his former position as traffic engineer of Houston.

—o—

PAUL RISTROPH (Mem.) is now traffic engineer for the New Orleans Public Service Commission. He acted as traffic engineer for the City of New Orleans after his discharge as a colonel in the Army.

—o—

HENRY K. EVANS (Assoc. Mem.) has resigned as editor of Traffic Engineer magazine and has been replaced by Robert O. Swain (Assoc. Mem.)

—o—

RALPH DORSEY (Mem.) Los Angeles' traffic engineer uses 60,000 gallons of paint annually to mark safety zones and lanes in his west coast city, according to the Los Angeles Times.

—o—

LIGHT B. YOST (Assoc. Mem.) and **CHARLES PRISK** (Mem.) are assisting in the 1947 President's Safety Conference.

—o—

I.T.E. members appointed to the National Conference on Uniform Traffic Accident Statistics at its May meeting include Arnold Vey, chairman; Merwyn Kraft, Henry Evans, Frank Kreml and David Baldwin.

SECRETARY'S COLUMN

By special request of "ye new Editore," I will try to scribble a few last minute items each month that will be of interest to members.

First, thanks for the many fine letters from members offering congratulations and supporting my endeavors—hope I can live up to all that is expected of me. Thanks again for the immediate and over-whelming response to my plea for names (approx. 500 to date—May 15) to receive free copies of our special May issue. I can still use that many more from the balance of the membership. Advertisers are increasing, many new applications in for membership (thanks to our new head of the membership committee—Harry Porter, Jr., [Mem.]), and most important—we're getting lots of inquiries, requests for publications, etc. from foreign countries. The program for the annual meeting is pointing up to the biggest and best in our history. To date we have 99% acceptances from selected speakers. A bow to Cy Vey, (Mem.) and his program committee, and the local arrangements group of the Detroit section. Another new ITE Section blossoming—a Mid-west Section with headquarters in Chicago. Matt Sielski (Mem.) is handling the footwork. They have already submitted a constitution and by-laws for board approval. Looks as if we'll have 20 or more new junior members from the regular and military classes at the Yale bureau. Glad to note the army's interest. Howard Baker (Affil.) just out of a long seige in the hospital. A must in my first column is "hats off" to all past and present elected secretaries. They accomplished something short of a miracle with their voluntary contributions to the INSTITUTE. I really have a high-calibre, high-standard precedent to equal—one moment of silent prayer, please.

—Robert S. Holmes

LETTERS TO THE EDITOR

While we all revel in the joys and expectancies of the awakening of nature called "Spring," there is one curious effect upon the female of the human species that is quite disturbing to the general feeling of anticipated pleasure. This is her devotion to the mysterious rite known as "Spring House Cleaning," concerning which she will express emphatic distaste, which however never decreases in the slightest degree her energetic devotion to the cause of "chasing dirt" in the tradition of the advertising of Old Dutch Cleanser.

Usually the conversational monologue runs something like this as the tired male returns home to find the entire establishment in an uproar of misplaced furniture and domestic revolution.

"Now George (or Jim, or Bobo, or whatever term of proprietary enslavement may be customary), before you take a bit of your supper from the shelf in the kitchen, I want you to march into the den (or more likely to the attic, or perchance the cellar) and tell me what is to be done with that mess of old books and papers that you insist upon keeping and never use from one year's end to the next. I am sick and tired of moving them time after time, and I am just not going to put up with your slovenliness any longer. You have got to make up your mind to get rid of them someway or I will call the Salvation Army truck to cart them away. And Good Riddance for I never saw such a filthy lot of dust catching things in all my life. And you needn't think you can get away with tieing them up in an old newspaper as you did last year, because they are too heavy for me to move, and I won't put up with such disorderly appearances any longer. SO MAKE UP YOUR MIND WHAT YOU ARE GOING TO DO WITH THEM! AND DO IT!"

Well, Brother, for once here is a snappy come-back that you can dish out to the "Little Woman" that will burst the whole bubble of her ire. Just say,

"Sure they look like the devil, and I don't blame you a bit after taking care of them all these years. But I have got exactly the right place to dispose of them, and as soon as I get a bite to eat (in the kitchen, did you say?), I will pack them into a carton and send them to the Historian of the Institute of Traffic Engineers, who is looking for just such material to add to the Library which they are assembling."

The address is: W. B. Powell, 715 Delaware Avenue, Buffalo 9, N. Y.

Dear Editor:

I thought you would be interested to learn that the bond between members of the Institute was again evident at the recent meeting of the Missisippi Valley Conference in Chicago.

Seven of us got together at a luncheon at the Edgewater Beach Hotel on March 17th

(Continued on page 401)

(Continued from page 398)

and solved all of the important and several unimportant National traffic problems including signs, signals and pavement markings.

Those present at the luncheon were as follows: Russell S. Deetz, H. G. Eckhardt, Harry Harrison, Carl McMonagle, Russell Newell, Wayne Volk and Professor C. C. Wiley.

As usual, we had a good talk fest, resulting in an interesting exchange of ideas.

Yours very truly,
H. G. ECKHARDT,
Assistant Chief Engineer.

CASE AGAINST TOLL ROADS

The case against toll roads in the U. S. is documented by Public Roads Commissioner Thomas H. MacDonald in a letter to a New Hampshire newspaper editor, according to an announcement by the Automotive Safety Foundation.

Mr. MacDonald points out that a toll road can't provide complete service, because it has to exclude local traffic, which requires parallel facilities. It has to be designed to extravagant standards to compete with them, and financed by bonds at interest rates higher than the public would have to pay for money borrowed to construct a free facility.

A passenger car toll of 1-cent per mile, he says, is equivalent to a gasoline tax of 12 to 16 cents per gallon. This method of financing highway improvement is an "inadvisable and expensive expedient".

The Commissioner says that fertile ground for toll road promotion is provided by opposition to gasoline tax increases, which "arises from the petroleum industry rather than from the consumer of gasoline who actually pays the tax".

EDITOR'S NOTE: A discussion of an article in the Saturday Evening Post, which prompted the newspaper editor's request, will appear in an early issue of Traffic Engineering.

TUTHILL GUARD RAILS
SAFETY
APPEARANCE
VISIBILITY
TUTHILL GUARD, with its convex surface and spring brackets, is safer, for two reasons. It can be seen quicker at longer distances. Its deflective action deflects cars back into highway and absorbs impact. Result—more lives saved—less damage to car and guard rail. Low upkeep cost.
REQUEST DETAILS
Pacific Coast Distributors and Manufacturers
U. S. SPRING & BUMPER CO.
Los Angeles, Calif.
TUTHILL SPRING CO.
764 W. POLK STREET, CHICAGO 7, ILLINOIS

ON THE SHELF

COORDINATED FRINGE PARKING AND TRANSIT SERVICE, Pentagon Parking: a Preliminary Report on Coordination of Capital Transit service and private automobiles between Virginia residential areas and the District of Columbia—by all-day fringe parking of private automobiles at Pentagon.

Prepared jointly by Research and Planning Staff of Capital Transit Company and Executive Engineering Secretary of District of Columbia Motor Vehicle Parking Agency. 1946. 14 pp. mimeo.

OFF-STREET PARKING: a Selected List of References in Zoning Ordinances Providing for Off-Street Parking. American Society of Planning Officials, 1946. 30 pp. mimeo. Revision of 1941 publication.

METHOD FOR RECORDING LATERAL POSITION OF VEHICLES. F. H. Green. For presentation at the Twenty-sixth Annual Meeting of the Highway Research Board at Washington, D. C., December, 1946. 22 pp. mimeo.

Description of method of recording data on vehicle acceleration and deceleration, and multiple placement, by mounting an electrically operated motion picture camera on bridges or behind road signs.

Georgia Tech Traffic Institute

The Ninth Institute for Traffic Training, staffed by some of America's top experts in highway safety, will be held June 16-27 at the Georgia School of Technology. Key workers in the traffic field and related activities will be offered specialized instruction in the modern techniques of enforcement, engineering and education developed to curb death and injury on the highways. The Institute curriculum this year is particularly designed to promote the balanced program of accident prevention recommended by the President's Highway Safety Conference.

ASF to Review Richmond Expressway Plan

At the invitation of the ownership of Richmond's two daily newspapers, the Times-Dispatch and News-Leader, the Foundation will shortly undertake an engineering review of proposals now pending for the construction of a modern expressway in the heart of the Virginia capital.

The request has the official backing of the City Council, the city, state and national highway engineering agencies involved and the consulting engineers who made the original study. The idea of a freeway is supported by the Richmond Chamber of Commerce, the Retail Merchants group, the Motor Club and other interested civic groups. All costs of the study will be paid for by the newspapers as a contribution to the further development of the city.

JEEP PATROL CARS

Toledo, Ohio, is using four Jeeps in traffic control work. These cars have replaced motorcycles and are used in connection with traffic violations as well as for escort cars and for supporting other squad cars where extra officers are needed. Painted white with the word "POLICE" on the cowl, on the sides, on both sides of the hood and on the rear, the Jeeps have been a great factor in preventing traffic violations on the most heavily travelled streets, according to the police chief.

—*Public Management, March, 1947*

ACCURATE AUTOMATIC ADEQUATE . .

ALL THE WAY from MOTORIST'S finger-tip to City Treasury . . .

Accurate, cumulative coin register shows dollars and cents

Adequate, full-week capacity coin box with coin-dumping feature assures economical, scheduled coin collection.

Automatic collection completed with one quick motion. (Conventional sealed boxes available if preferred)

ONLY PARK-O-METER

provides the economy and safety of automatic operation all the way from motorist's finger-tip to City Treasury. Tamper-proof coin register keeps accurate, cumulative record of amount deposited. The large capacity coin box permits coin collection on scheduled weekly basis and the automatic coin-dumping feature speeds collecting operation. In fact the Park-O-Meter System will save your city $5.00 per year, per meter, over the sealed box collection method.

ASK FOR LITERATURE

describing Park-O-Meter's *From-Motorist to-Treasury* System. It's new . . . modern.

Magee-Hale

PARK-O-METER COMPANY

Commerce Exchange Building

OKLAHOMA CITY 2, OKLAHOMA

Personalities . . . .

This is the first in a series of articles about Institute Members

J. W. Arch Bollong not only is one of the pioneer traffic engineers, but probably has had the longest tenure of office in the same city in this profession of any Institute member. Arch Bollong has been traffic engineer of Seattle since 1919. He has been employed continuously by that city since 1916 as an inspector, sanitary engineer and maintenance engineer. Previously he worked for a telephone company, a construction firm in Canada and a private engineering organization. His first job with the City of Seattle was from 1906 to 1908 when he was employed by the city engineer.

Mr. Bollong was born in Glenwood, Iowa, and studied civil and electrical engineering at the University of Wisconsin.

A former director of the Institute of Traffic Engineers, Mr. Bollong has been active in traffic work both locally and nationally. He was a member of the National Conference on Street and Highway Safety in 1929; traffic engineer for the Highway Transportation Commission in Washington from 1933 through 1939; director of the City Official's Division of the American Road Builders' Association; president of the Eleven Western States Safety

(See BOLLONG *on page 407)*

The president of the Institute of Traffic Engineers hails from Kansas City, Mo., where he has worked since obtaining his civil engineering degree from the University of Michigan in 1926. Thomas J. Seburn has been active on some type of traffic work from the time he was graduated from college. In the early years of experience he was employed by the Kansas City Public Service Company. His first traffic engineering work was on the Kansas City traffic survey conducted in 1929 and 1930.

Mr. Seburn was appointed traffic engineer of Kansas City in December, 1930. His organization was the first to adopt the prow type of safety zone protector, which today is frequently referred to as the "Kansas City island". Kansas City was one of the first cities to install parking meters and was one of the pioneers in requiring lower night speeds. The traffic engineering division, which is part of the Department of Public Works, has in addition to its regular functions, the responsibilities of street lighting in Kansas City.

Mr. Seburn was born in Indianapolis. In addition to his work in Kansas City he is consultant for Springfield, Mo., and Oakland, Calif.

His professional societies, in addition

(See SEBURN *on page 407)*

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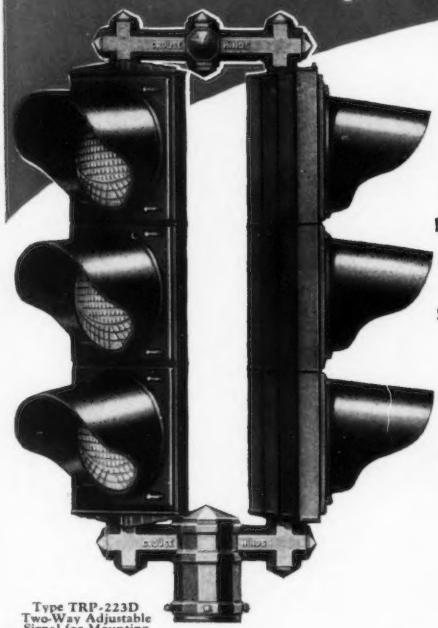

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The bodies are of the Crouse-Hinds sectional type, with all of the features that assure efficient operation, dependable service and low maintenance cost.

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647

NO PARKING BUS STOP
ONE HOUR PARKING 7 AM TO 6 PM
PARKING DIAGONAL
ONE WAY DO NOT ENTER
15 MINUTE PARKING 7 AM TO 6 PM
DAYTIME ONLY
NO PARKING HERE TO CORNER

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OPEN DISCUSSION

The international sign system, predicated on a symbol and shape basis, was standardized by the League of Nations when the United States was still sufficiently isolated to refrain from joining any international parley. The success of the international system is reflected by its almost universal adoption on the European continent.

Certain features of the international system appealed to many American troops in the European theater. Certain signs, especially those covering railroad crossings and parking regulations, are readily understood without recourse to the printed word. Along the Mexican border in Texas stop signs must be duplicated in order to permit the word "stop" to appear as "alto" in the Spanish language.

Much of the international system does not lend itself to facilitate the complex traffic patterns in the United States. Parking here is not simply divided into unrestricted and prohibited areas, but rather more into restricted periods of the day. Whether the parking sign or the demand for parking complicates our problem is a moot question. Likewise, whether or not our sign system has more merit than the one adopted by the League of Nations can not be determined until both systems are appraised.

It is a reasonable assumption to believe that once the United Nations becomes the world's most potent political power, highway signs will be one of a great number of subjects requiring both clarification and standardization. The increase in the use of motor vehicles in countries other than our own is just a matter of a few years. This increase together with a greater widespread construction of international roads will also promote the need for uniformity of highway signs.

The progress of our own 48 states in sponsoring a uniform sign manual is but a small step in fulfilling the needs of the world.

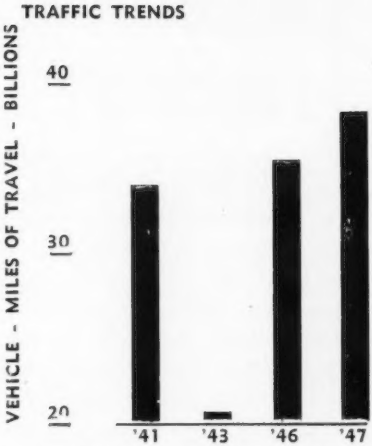
In order that ITE members may have the benefit of the opinions of those who have seen both the U. S. and international systems, a series of discussions will be initiated in the September issue. No discussions will be solicited. Contributions should be limited to 500 words and sent to the Editor, Traffic Engineering.

President's Conference to Meet Again

A meeting of the Action Group of the President's Highway Safety Conference is scheduled for June 18, 19, and 20, in Washington, D. C.

SIGNALMEN TO MEET

About 600 municipal signal engineers and suppliers will meet at Grand Rapids, Mich., September 29-30, October 1-2, 1947 for the 52nd Annual Meeting of the International Municipal Signal Association, Inc.



TRAVEL ON RURAL ROADS FOR FIRST THREE MONTHS OF 1941, 1943, 1946 AND 1947

[Based on Public Roads Administration Data]

SEBURN . . .

(Continued from page 404)

to the ITE, include, American Society of Civil Engineers, American Public Works Assoc., Highway Research Board, National Safety Council, Missouri Society of Professional Engineers, KC Engineers Club, and the Illuminating Engineering Society.

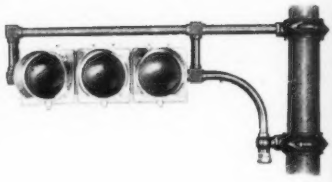
BOLLONG . . .

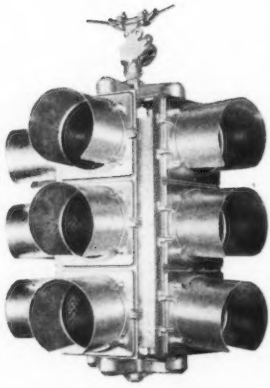
(Continued from page 404)

Conference, 1941; vice chairman, Western Region, National Institute for Traffic Training; and president of the Seattle Chapter of the American Association of Engineers, 1922-1926.

In addition to ITE, Mr. Bollong belongs to the following professional and social clubs: Highway Research Board, American Association of Engineers, International Municipal Signal Assoc., American Road Builders Assoc., American Public Works Assoc., Seattle Municipal League, Chamber of Commerce, Engineer's Club, Artic Club, and Nile Temple of the Shrine. He is a licensed professional engineer.

CHECK
EXAMINE!
COMPARE





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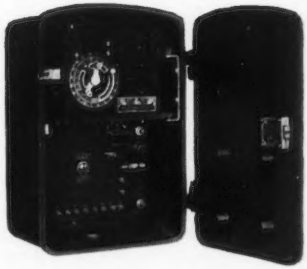

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OFF-STREET PARKING NEWS ROUNDUP

Wheeling, W. Va.

Jay Henry, City Engineer, reports that a Municipal Wharf Parking Authority, appointed in 1944 and consisting of 3 citizens, has developed a 3-story concrete storage plaza.

Madison, Wisc.

T. F. Harrington, City Engineer, reports that a Parking Commission has been recently appointed and is in the process of purchasing parking lots.

Miami Beach, Fla.

J. L. Hoover, Traffic Director, states that the Municipal Parking Committee has seen to it that four parking lots were constructed, which are being operated under the Committee's jurisdiction. Future financing will be from parking meter receipts.

Burlington, Iowa

According to Frederick Bell, Traffic Engineer, sites have been acquired, and lots constructed. Parking studies have been made and improvements are being made on the river front to provide parking space.

Beloit, Wisc.

According to City Engineer Wm. A. Collins, plans are in progress to add a deck over the principal parking area. Financing will hinge on revenue bonds and receipts from parking meters.

Jackson, Miss.

The city now has on hand $400,000, made available by a bond issue, which will be used to finance off-street parking facilities acquisition and construction. Surveys are now being made and condemnation proceedings have been instituted for one site, according to J. J. Halbert, Director of Public Works.

Alhambra, Calif.

The City Engineer reports that sites have been acquired and parking lots are being operated by the City Commission. The Alhambra Chamber of Commerce has appointed a committee and is now circulating petitions under the provisions of the State Vehicle Parking District Act of 1943 for formation of a vehicle parking district in Alhambra.

Greenwich, Conn.

J. W. Cone, Commissioner of Public Works, reports that the city has provided four small parking lots which are being operated, under authority of a Special Act of the State Legislature. A town meeting will be called to adopt an ordinance as provided for in the Act, to determine what portion of the total cost of the improvement shall be assessed against the properties benefited.

Port Huron, Mich.

City Engineer A. T. Carlisle states that the City Commission has acquired sites and constructed parking lots. The city also leases property and operates a parking lot thereon.

Washington, D. C.

A Motor Vehicle Parking Agency has been created by an Act of the 77th Congress. This Act authorizes the Commissioners of the District of Columbia to acquire, operate and regulate public off-street parking facilities, and creates the Parking Agency, composed of seven members, to assume the active direction of the parking program. The power to purchase and sell property is not assigned to the Agency, but rests with the Commissioners.

Brookline, Mass.

According to Asst. Engineer A. E. Spooner, consideration is being given to installing parking meters, and proposals have been made that the town acquire certain lots in the vicinity of

the business area to be thrown open to public use, but no action has been taken.

Cambridge, Mass.

City Engineer Edgar Davis reports that 450 parking meters have just been installed in the Central and Harvard Square sections. Two parking lots on city owned land are being operated at present by the city.

Royal Oak, Mich.

E. J. Giffels, City Engineer, states that a parking committee, appointed by the President of the Chamber of Commerce, is working with the City Manager and Commission in planning an off-street parking program. At present there are several free parking lots in the business district, maintained by the city. Taxes on these vacant areas are paid by the Chamber of Commerce, thus obtaining their use for parking on more or less a day to day basis. Realizing that use of these lots may be lost, the Parking Committee is attempting to secure other parcels by purchase or long term lease. It is planned to set up a Parking Authority with powers to purchase land, maintain parking lots, etc.

Fort Wayne, Ind.

City Traffic Engineer James T. White advises that a Parking Authority will probably be set up within a few months. It is proposed that the Authority be composed of city officials and laymen. The financial plan will probably involve issuance of revenue bonds to be retired from parking meter income.

Dearborn, Mich.

Off-street parking space for buildings used by the public is required by a new Dearborn, Mich., ordinance according to the International City Managers' Association.

The ordinance applies particularly to new theatres, auditoriums, and stadiums. Vehicle storage space is required on the basis of 200 square feet for each four seats. Parking space requirements are also established for retail stores and office buildings, banks, restaurants, hotels, bowling alleys, and other places of public assembly except churches.

Great Neck Plaza, N. Y.

Parking meters were installed in December of last year. The village is now considering two plans for municipal parking lots, one proposed as a result of a parking survey conducted by Henry Evans and J. A. Carrothers of the National Conservation Bureau, and the other submitted by the Great Neck Chamber of Commerce.

Baltimore, Md.

A community council on street traffic, composed of representatives of 24 civic and trade groups, has endorsed legislation which would permit the city to build and operate parking lots and garages, or to lease them to private operators.

Pittsburgh, Pa.

In Pittsburgh the Regional Planning Association has recommended that the city provide off-street parking facilities which would be operated by the city through a municipal parking authority. Twenty new parking garages of three to five levels would be built, and the city would lease a number of additional garages and lots, the entire program to cost $36,000,000, financed by 30-year revenue bonds.

Minneapolis, Minn.

In Minneapolis the Civic Center Development Association has released plans for 10 proposed parking garages on the fringes of the business district, some above and some below ground.

Eugene, Ore.

In Eugene, Oregon, a recently completed survey shows a need for additional off-street parking space for 1,400 to 1,800 cars, and that 10 years hence parking space will be needed for 2,300 to 2,700 cars. The 10-year estimate was based on the assumption that population will increase 20 per cent

and that car ownership will increase from the present one car to three persons to one car for two persons. As the result of this survey the Chamber of Commerce and Realty Board adopted resolutions urging the council to consider acquisitions of off-street space immediately for 1,600 cars, and that the city require new or expanded business buildings to provide their own parking space.

Miscellaneous

New York City has extended the daytime parking ban to hundreds of blocks, including nearly all of the financial district. Atlanta and Cleveland also have started to ban daytime parking on main business streets . . . . Birmingham, Alabama, has adopted an ordinance prohibiting deliveries by large trucks in the downtown section between 8 o'clock and 6 o'clock daily . . . . State legislatures in California, Ohio, and Oregon, are considering bills designed to expand public auto parking facilities in cities. Maximum rates and bonding of operators of privately operated lots would be regulated by bills introduced in Massachusetts, Pennsylvania, and Rhode Island.

Father of Road Markers Dies

Woody Hockaday, 61, who erected the nation's first highway road markers and invented the gasoline station, died recently in Macon, Mo.

Few of today's motorists have ever heard of him.

In addition to the road markers and the first service stations, he originated the "Blue Book" which was considered "must" reading for every motorist planning a trip of any distance. It cost 50 cents and told at which corner a driver should make a turn if he hoped to arrive at his destination.

—*Williamsport Sun*

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